JOURNAL
OF THE
AMERICAN VETERINARY MEDICAL ASSOCIATION

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Volume 125 AUGUST 1954 Number 929

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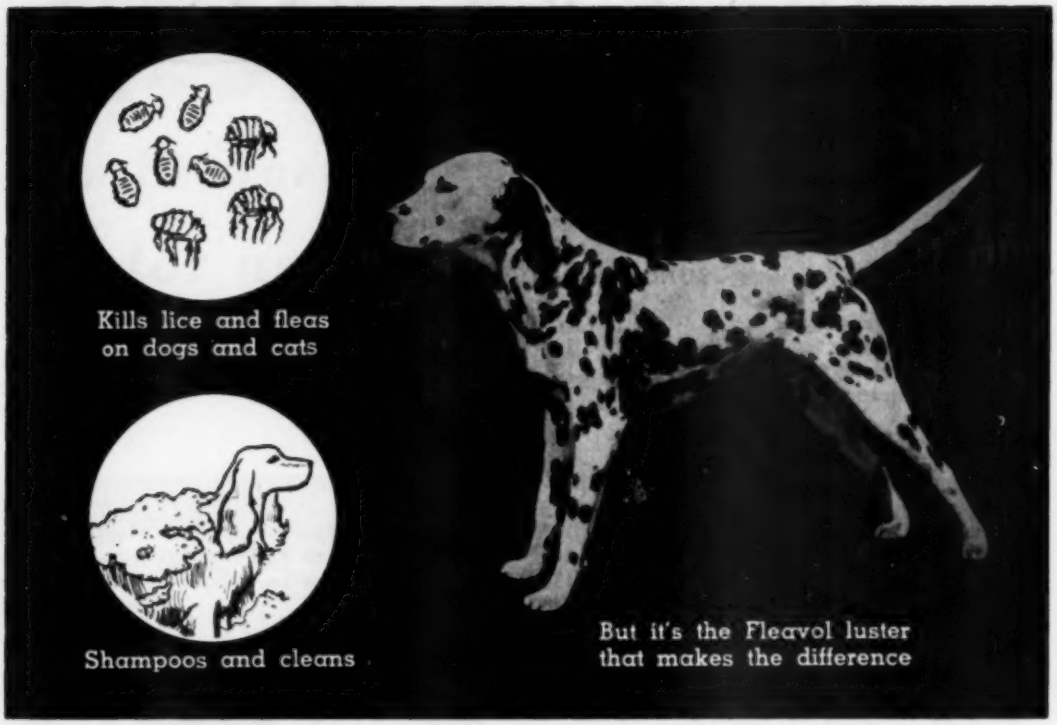

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$10.00 per annum Foreign $10.50; Canada $10.50 Single Copies $1.00 Prepaid in U.S.

Published monthly at 600 S. Michigan Ave., Chicago, Ill., by the American Veterinary Medical Association. Entered as second class matter August 10, 1932, at the Post Office at Chicago 5, Illinois, under the act of March 3, 1879. Additional entry at Mendota, Ill. Accepted for mailing at special rate of postage provided for in Section 538, act of February 28, 1925, authorized August 10, 1932.

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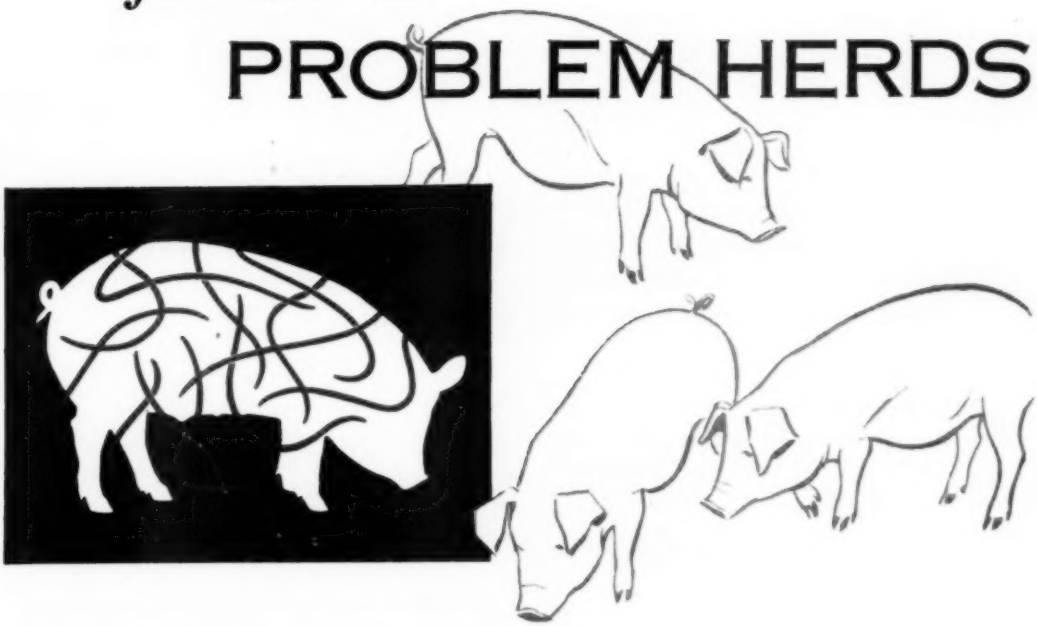

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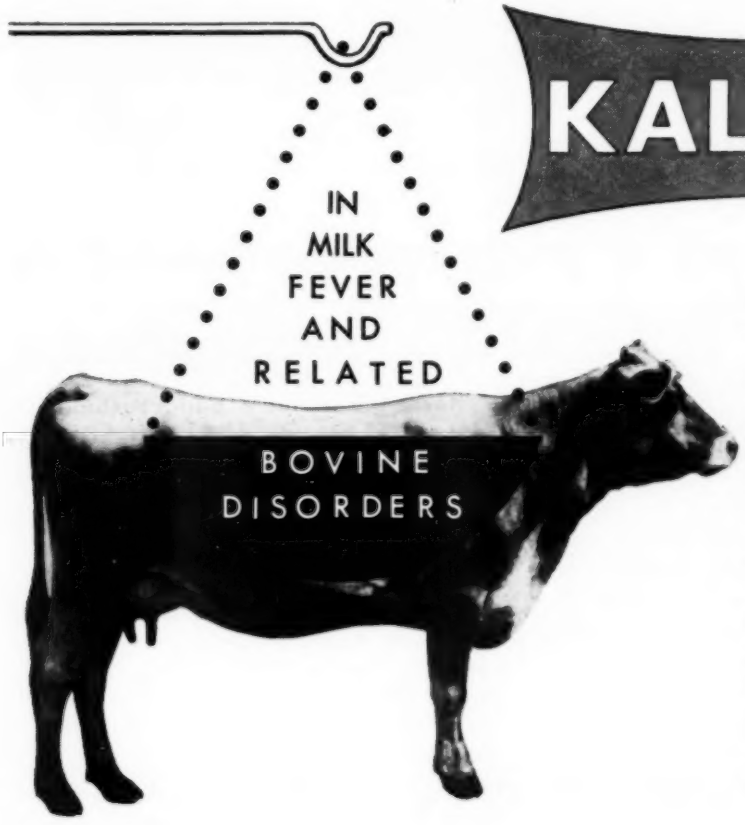

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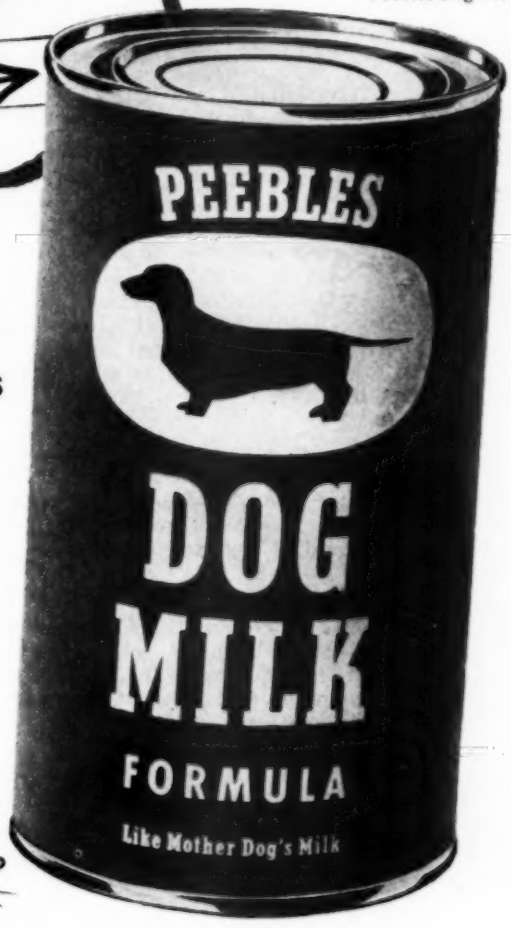

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AVMA ☆ Report

Veterinary Medical Activities

✦ Executive Secretary Hardenbergh met on June 22 with the Committee on Local Arrangements to complete plans for the Seattle Convention. Only a few details are yet to be worked out to assure the very best in educational and entertainment features for those who attend the Ninety-first Annual Meeting of the AVMA, August 23-26.

★ ★ ★

✦ Veterinarians taking the Illinois State Board examination, June 28 and 29, included a visit to AVMA headquarters during their stay in Chicago. Nearly 100 applicants for Illinois licenses sat for the examination, the largest group ever to take the Illinois board examinations.

★ ★ ★

✦ The Commission on Veterinary Education in the South, a subcommittee of the Southern Regional Education Board, met in Atlanta, Ga., July 8 and 9. Assistant Executive Secretary Kingman represented the AVMA on this commission.

★ ★ ★

✦ President-Elect A. H. Quin took part in the program of the Mississippi V.M.A. conference held at Biloxi, Miss., July 11, 12, and 13. Dr. Quin spent July 15 in the AVMA office in Chicago, at which time the committee appointments for the coming AVMA year were planned. It is hoped that letters of appointment and acceptances from those asked to serve on committees can be accomplished prior to the Seattle Convention so that many of the committees will have an opportunity to do some preliminary planning while members are together in Seattle.

★ ★ ★

✦ Reports from standing and special committees for 1953-1954 were preprinted and mailed to the delegates to the House of Representatives and to members of the Executive Board on June 28. This advance mailing of committee reports makes it possible for delegates to study them carefully prior to the annual meetings of the Board and of the House.

★ ★ ★

✦ Thirty-five officers of the Army and Air Force Veterinary Corps attending the Dairy and Meat Hygiene School at the Quartermaster Depot, Chicago, visited Association headquarters on June 2, 1954. Members of the AVMA staff spoke to the group on the organization and activities of the Association and other professional matters.

★ ★ ★

✦ Russell G. Rongren, director of AVMA membership services, attended the National Institute for Commercial and Trade Organization Executives, Northwestern University, June 28-July 3.

★ ★ ★

✦ Mr. John McLaren, public relations counsellor from the Des Moines office of L. R. Fairall and Co., spent Friday, July 23, in the AVMA office discussing convention publicity. Mr. McLaren met with the public relations group of the Committee on Local Arrangements on July 14 in Seattle, and reports that prospects for coverage of the convention by press, radio, and television are good.

★ ★ ★

✦ The AVMA Special Committee on Food and Milk Hygiene conducted a seminar on meat inspection in Omaha, June 15-17. Those attending included representatives from 17 colleges of veterinary medicine in North America, members of the committee, and guest speakers. The seminar was designed to provide an opportunity for faculty members teaching food hygiene subjects at the various schools to exchange information on important phases of this subject.

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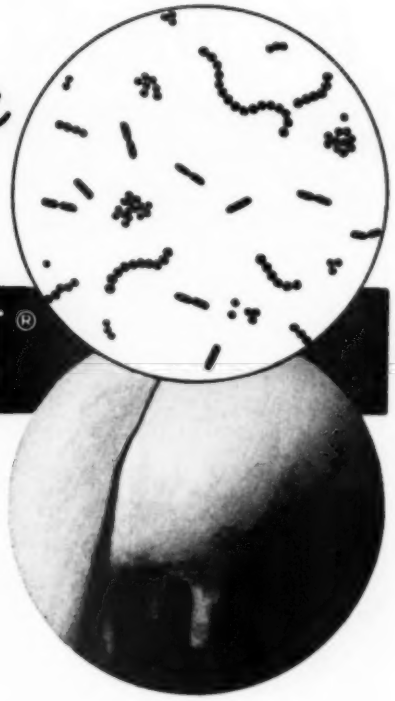

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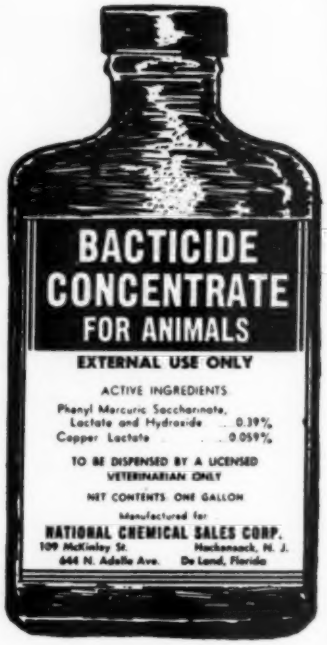
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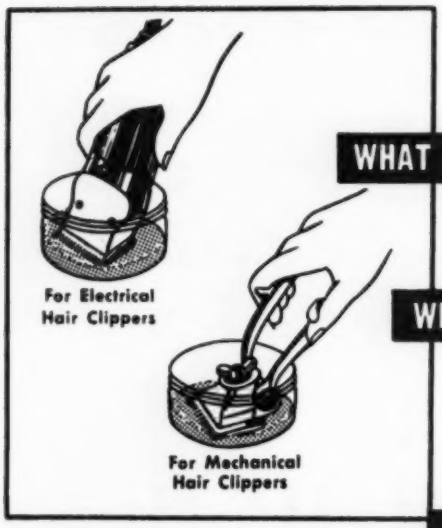

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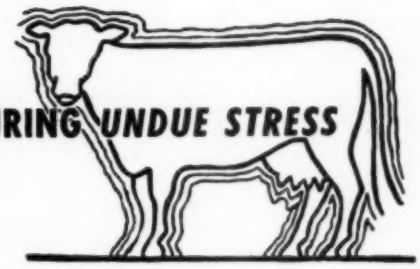

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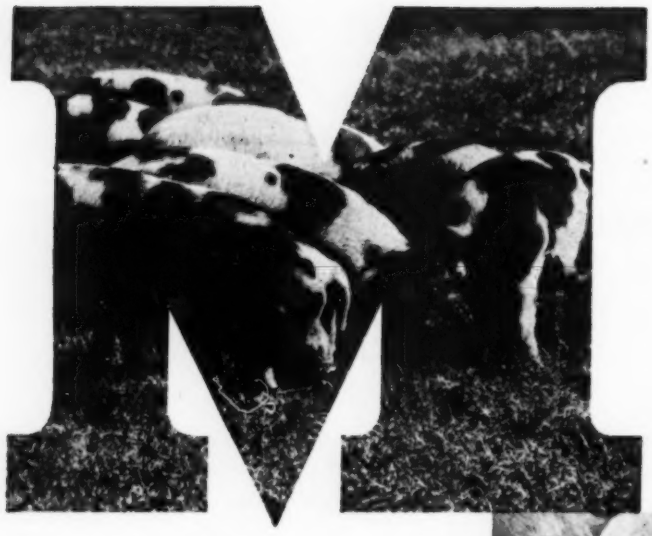

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Journal
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American Veterinary Medical Association

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VOL. 125 AUGUST, 1954 No. 929

Treatment of Canine Distemper with SRH* Intravenously

C. A. PLEUGER, D.V.M.

Cincinnati, Ohio

CANINE DISTEMPER has been recognized since the early part of the nineteenth century. It is a serious febrile disease with protean manifestations which, in different individuals, produces a varied clinical picture, with exanthematous, gastroenteric, pulmonary, meningitic, and encephalitic manifestations.

Although Carré recognized the viral etiology of this disease in 1905, certain bacterial organisms for many years afterward were still labeled as the causative agents. Bacterins containing these organisms, as well as serums, came into use in the United States for distemper prophylaxis and therapy, but until recently there was little the veterinarian could do beyond using palliative measures when confronted with severe cases of canine distemper. However, with the synthesis of sodium-sulf-ricin-hydrazine (SRH), a new chemotherapeutic compound, not derived from aniline, is available for the treatment of canine distemper.

METHOD

Since the fall of 1953, experiments with SRH have been made in selected cases, mostly dogs showing symptoms of viral origin, with hyperpyrexia from 103 to 107 F. The dogs ranged in age from 2 months to 2 years. When admitted to the hospital with spasms, the dogs were treated symptomatically with the different barbiturates, both orally and parenterally, and then doses of SRH were given intravenously.

If, twenty-four hours later, there was anorexia or a temperature 1 degree above normal, we repeated the dosages of SRH given initially. Rarely was it necessary to give injections after the third day. However, where epileptiform symptoms were severe, the dogs were checked for a week or longer for recurrences of the spasmodic symptoms. For at least a week, temperatures were taken every four hours.

The solution should be given very slowly, at the rate of about 1 cc. in five seconds. Death followed rapid injections in 2 dogs weighing only 5 to 7 lb. In a number of animals with unusually high temperature, and in young dogs, some shock was indicated by an unsteady gait for five or ten minutes. In some of these cases, small doses of epinephrine brought rapid recovery. In very small dogs, SRH was given intraperitoneally, but the intravenous method is preferred.

In cases with no spasms and with temperatures no more than 2 degrees above normal, a single intravenous dose of SRH, followed with good nursing and symptomatic treatment, was beneficial in more than 85 per cent of the cases. We advised a hospital check-up each week for not less than three weeks.

DISCUSSION

In most animals with an enteric form of distemper, SRH seemed to help check severe diarrheas. Neomycin with kaopectate,* and streptomagma,** also gave satisfactory results, as did suspension of cothamid.†

Experiments were mostly with the nervous or epileptiform cases with convulsions. In most cases, SRH intravenously, with sedatives, controlled the spasms, and patients were discharged in a week or two when their temperatures had been continuously normal for a week. There was no

Dr. Pleuger is a small animal practitioner in Cincinnati, Ohio.

*SRH (sodium-sulf-ricin-hydrazine) was synthesized by Walter Winckler, director of research, Ricino Chemicals, Inc., New York, N. Y.

*Produced by the Upjohn Co., Kalamazoo, Mich.
**Produced by Wyeth, Inc., Philadelphia, Pa.
†Produced by Lloyd and Dabney, Inc., Cincinnati, Ohio.

nausea after intravenous injections of SRH.

In neglected cases in which symptoms of chorea, paralysis, and sometimes blindness were found, euthanasia was advised.

The number of unsatisfactory responses amounted to less than 20 per cent of the total treated. In more than 200 cases where SRH was used in the early stages of the disease, the patients made excellent responses.

Dosage.—A dose of 1 cc. of SRH solution, containing 100 mg. of the drug, is recommended for each 5 or 6 lb. of body weight, the doses being repeated in six to eight hours if the temperature has not receded appreciably. The following scale, graduated according to the condition and weight of the animal, is recommended:

1 cc. of SRH per 5 lb. of dog
2 cc. of SRH per 10 lb. of dog
4 cc. of SRH per 25 lb. of dog
5 cc. of SRH per 30 lb. of dog

Results.—The results of a study of toxicity, effectiveness, and blood levels (clinically) of SRH, in 10 dogs, are given in table 1. The drug may have to be administered more often than once daily to obtain effective blood levels. In animals with an unusually high temperature, a larger dose than 0.2 cc. per pound of body weight is needed to be certain of a quick, adequate level of the drug in the blood.

Toxicity Studies in Vivo in 150 Mice.—The drug, SRH, a hydrazine compound, is active in *Mycobacterium tuberculosis* No. 607 *in vitro*. Isonicotinic acid hydrazide, also active in *M. tuberculosis* No. 607, *in vitro* and *in vivo*, was therefore used as a standard for toxicity tests in 150 mice.

The acute toxicity of SRH, orally and intraperitoneally, was less than that of isonicotinic acid hydrazide. The subacute toxicity of SRH (10 doses at 20% of $l.d._{50}$, over a period of 12 days), orally and intraperitoneally, was the same as that of isonicotinic acid hydrazide, considering gain in weight as an index of lack of toxicity. The volume injected or administered was kept constant at 0.5 ml./20-Gm. of mouse.

Microbial Spectrums in Vitro of SRH.—All test organisms were grown on nutrient glucose agar slants for eighteen hours at 37 C. and the resulting growth was suspended in sterile physiological saline solution to approximate 50 per cent transmission, using a No. 650 filter.

The test organisms were: *Sarcina lutea*

TABLE 1—Observations of 10 Dogs Treated with SRH

Case (No.)	Diagnosis	Weight (lb.)	Dosage	Temperature (F.) When treated	In 6 hours	In 8 hours	In 24 hours
No. 650 Wire-Haired Fox Terrier	Distemper	22	4 cc.	105.0	104.0	103.4	102.4
No. 720 Shepherd cross	Distemper	15	3 cc.	104.0	103.2	102.6	101.8
No. 725 Boston Bulldog	Distemper	18	4 cc.	106.0	105.0	3 cc. SRH	103.2 2 cc. SRH, 102.4 6 hr. later
No. 727 Boxer cross	Peritonitis following ovariectomy	25	5 cc.	107.0	104.2	3 cc. SRH, 103.0 8 hr. later 3 cc. SRH, 102.0 4 hr. later	
No. 740 Fox Terrier	Mixed type infection due to trauma in dog fight	32	6 cc.	105.4	103.0	3 cc. SRH	102.6
No. 742 Mongrel	Distemper	20	4 cc.	104.6	103.4	102.8	102.0
No. 755 Collie	Distemper	40	5 cc.	105.0	104.2	103.0	102.4 3 cc. SRH; next day 101.4
No. 761 English Setter	Distemper	55	5 cc.	104.2	103.0	102.2	101.8
No. 785 Spaniel cross	Distemper	30	5 cc.	103.4	102.2	101.6	Normal
No. 788 Shepherd	Distemper	60	6 cc.	106.0	105.4	103.6 5 cc. SRH, 103.0, 6 hr. later	102.4 next day

No. 272; *Pseudomonas aeruginosa* No. 9027; *Mycobacterium tuberculosis* No. 607; *Proteus vulgaris* No. 6380; *Klebsiella pneumoniae* P. C. I. 602; *Aerobacter aerogenes* No. 8508; *Mycobacterium avium* No. 7992; *Salmonella schottmülleri* (Squibb); *Escherichia coli* No. 9637; *Mycobacterium phlei* No. 355; *Staphylococcus aureus* P. C. I. 209-P; *Salmonella typhosa* (Squibb); and *Bacillus subtilis* No. 6633 (spore suspension).

SUMMARY

1) No signs of toxicity and no untoward side effects were observed following intravenous injections of SRH.

2) This drug seems to neutralize toxins, reduce the severity of the disease, and hasten recovery.

3) Since nearly all the cases were brought to a favorable conclusion without any negative reactions, it would seem probable that there is a neutralization of the toxic antigens and a stimulation of the defense mechanism of the system which speeds up recovery.

4) Intravenous injections of SRH are valuable in the treatment of canine distemper.

5) SRH is effective in the treatment of canine distemper and infectious bacteremias.

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Recent Reports on Psittacosis

From 1930 to 1953, New Zealand banned the importation of all tropical birds. Since repeal of the embargo, at least six cases of human psittacosis have been diagnosed and the virus was isolated from 10 of 11 parrots recently imported.

From 1949 to 1951, when England had a ban on importing psittacine birds, 36 human cases reacted to the serum test, pigeons being the probable vectors. However, two months after their ban was lifted, a series of outbreaks occurred including the death of one psittacine bird dealer. Recently, in France, psittacosis was found responsible for the death of 2 pompadour pigeons and the illness of 2 others, the recovery of the latter being credited to the use of injected aureomycin.—*All Pets Magazine, June, 1954.*

The Epizootic Score Card

INFECTIOUS ECTROMELIA OF MICE

The mouse-breeding industry is threatened by the spread of infectious ectromelia or mousepox, caused by a virus related to vaccinia virus. This disease has been diagnosed in four breeding colonies in the United States in the past two years and is suspected in 18 other colonies. The acute cases may be ill less than a day before death and show few lesions, or swollen faces and pocklike lesions over the body may be noticed several days before death.

Chronic cases often show swelling and necrosis of the extremities. The entire colony is usually affected in six to eight weeks with a 50 to 95 per cent mortality. Diagnosis may be made by an agglutination test or by inoculation, the test mouse usually dying in four to six days with liver lesions, including white areas of focal necrosis. There is no known treatment and vaccination is usually impractical. The extermination of infected colonies and prompt reporting of all suspected cases is urged by a special committee of which Dr. Edward P. Offutt, National Institutes of Health, Bethesda 14, Md., is secretary.

ANTHRAX

During the first five months of 1954, 52 outbreaks of anthrax were reported from 14 states with a loss of about 100 animals, mostly cattle. In 40 outbreaks the source of the infection was believed to be the soil, in 12 it was unknown. Louisiana lost 20 cattle in 12 outbreaks, Illinois 11 cattle and 8 swine in ten outbreaks, and California 14 cattle in nine outbreaks.

PSITTACOSIS ON THE INCREASE

Ornithosis (psittacosis) has been diagnosed in over 100 workers in several poultry-dressing plants in central and southwestern Texas during the second quarter of 1954. One case was fatal. In each case the infection was believed to be from turkeys. The disease was identified in some source flocks, ill birds revealing lesions of

pericarditis, hepatitis, enlarged spleens, and varying degrees of air sac inflammation.

The virus has not been identified but it may be a more virulent strain than that which affects psittacine birds. Except for a few laboratory workers, known cases have been limited to persons dressing turkeys in poultry plants, no cases having been recognized in other handlers of turkeys alive or dressed. Similar, less extensive endemics occurred in Texas in 1948, 1951, and 1952. Illinois has recently reported that 37 human cases occurred in one county in 1953, believed to be due to exposure to infected chickens.

During the first twenty-six weeks of 1954, 312 human cases were reported in the United States, compared to 21 in a similar period in 1953 and none in a similar period of each of the previous five years (U.S. Dept. of Health, Education and Welfare). Most of these cases have been traced to association with psittacine birds.

Plum Island Contract Awarded

The contract for the Plum Island Animal Disease Laboratory construction was awarded in June. The Army engineer for the New York district will supervise the construction, which is expected to require about eighteen months. Plum Island is near the eastern end of the north fork of Long Island, N.Y., and the laboratory there will be devoted to the study of foot-and-mouth disease and foreign diseases of animals that are a threat to the livestock industry. Dr. M. S. Shahan of the Agricultural Research Service will be in charge of the research program.—*U. S. D. A., June 10, 1954.*

Beagles Lead Canine Population

From 1936 to 1953, canine registrations for all breeds totaled 2,937,069 (average 173,000 per year), 26 per cent of which were Cocker Spaniels. However, Cockers, which in 1936 had taken the lead from Boston Terriers by furnishing 15 per cent of the registrations, in 1953 relinquished the lead to Beagles with 14 per cent. The Cockers' greatest lead was in 1945 and in 1946 when they furnished 36 per cent of all registrations. Beagles were in third place in 1935 but, beginning with 1940, were in second place until 1953, when they became the leaders. Bostons, leading with 14 per cent in 1935, dropped to eighth place with 4 per cent in 1953, while Boxers, in eleventh place with less than 1 per cent in 1935, have risen to third place with 12 per cent of the registrations, followed by Dachshunds and Collies with about 6 per cent each. However, the greatest percentage gain, in 1953, was made by Weimaraners to take fourteenth place.—*Pure-Bred Dogs, Jan., 1954.*

The Speed of Animals

The greatest speed ever recorded for an animal is 219 miles per hour made by the Indian spine-tailed swift. A hawk (the European peregrine), the golden eagle, and the duck hawk each can dive about 165 to 180 miles per hour. Some homing pigeons can fly 60 m.p.h. over a short course or 55 for four hours. Ducks and geese can fly from 55 to 65 m.p.h. and the little humming bird 50 to 55.

The cheetah, the fastest animal on foot, can run 70 m.p.h., the black buck of India 65, and the pronghorned antelope of America 60 m.p.h. for 2 miles and 36 for 27 miles. A lion can charge at 50 m.p.h. while the fastest dog, the Saluka of Arabia (related to the Afghan hound), can run 43 miles an hour. Greyhounds and whippets sometimes do 34 to 40 m.p.h. A rhinoceros can keep up with a good horse for 2 miles and even an African elephant can outrun a man.—*Our Dumb Animals, June, 1954.*

Cat Scratch Disease

In four years, 160 cases of cat scratch disease have been reported from 27 states and eight foreign countries, 43 of them from the Washington, D. C., area. All were positive to the specific intradermal test and most of the patients had contact with cats. Regional lymphadenitis developed to suppuration in 47 cases; a mild fever and systemic symptoms were frequent, a transient rash appeared in many, and encephalitis complicated a few of the more severe cases. Studies have thrown no light on the etiology. Being a self-limiting disease, the evaluation of therapy is difficult but some believe that oxytetracycline, chlortetracycline, and chloramphenicol may be beneficial.—*J.Am.M.A., April 10, 1954.*

Neuroparalysis after antirabies vaccination with the Semple vaccine occurred in 17 of 14,199 human patients treated in Hong Kong from 1949 to 1952, an incidence of one to 831.—*J. Am. M. A., Jan. 9, 1954.*

Equine Encephalomyelitis in Florida

JOHN F. WINN, D.V.M., M.P.H., and JAMES E. SCATTERDAY, D.V.M., M.P.H.

Jacksonville, Florida

DURING the summer of 1952, the Florida State Board of Health and the Communicable Disease Center of the U. S. Public Health Service made a coöperative study of the fresh-water lake area of central Florida to determine the extent of encephalomyelitis affecting the human and equine populations during the seasonal outbreaks.

Veterinarians, local health officers, and county agents were interviewed for specific information concerning clinical cases. The entomology branch of the Florida State Board of Health furnished information relative to the mosquito populations, rainfall, temperature, and humidity. The Bureau of Animal Industry, U. S. Department of Agriculture, made available the reports received from practitioners in the state.

FINDINGS

Seventy-three cases of equine encephalomyelitis in horses, all fatal, were recorded by personal interview with veterinarians whose practice was concerned with livestock. Material from 1 animal was obtained, postmortem, for laboratory confirmation and was found to contain the eastern type of virus.

A study of seasonal distribution of cases indicated that most occurred during June and July (tables 1-3).

The age distribution was not complete, since this often was not recorded, but the practicing veterinarians upon interview estimated that most of the horses were less than 4 years old; the youngest was 9 months old. The sex distribution was fairly even: 39 mares, 5 stallions, 28 geldings, and 1 unknown.

The distribution of cases of equine encephalomyelitis in Florida is shown in figure 1. This area has many fresh-water lakes and sluggish rivers and streams. The elevation varies from sea level to 250 ft. above sea level. Vegetation, in most cases, is a prolific, rank growth and water plants are common in the swampy areas. Wild water fowl and mosquitoes are abundant, as well as several species of Tabanus and Chrysops. Rains are frequent, and the average maximum temperature for May in the central area was 88 F.; average minimum temperature was 65 F.

DISCUSSION

According to veterinarians, eastern equine encephalomyelitis has occurred in horses in Florida for many years. The farmers and cattlemen call it "blind staggers," and many vaccinate their valuable horses every year against eastern equine encephalomyelitis.

This disease has a rapid onset, with the temperature rising 5 to 6 degrees above normal. The animal becomes uncoördinated and walks in circles or staggers blindly, with the head drooping and bumping into objects. If in the corner of a corral or pasture, the animal will push against the fence

Fig. 1—Distribution of fatal cases of equine encephalomyelitis in horses in the fresh-water lake areas in Florida.

Dr. Winn is associated with the Communicable Disease Center, Public Health Service, U. S. Department of Health, Education, and Welfare, Montgomery, Ala.; Dr. Scatterday is state public health veterinarian, Florida State Board of Health, Jacksonville.

TABLE 1—Distribution of Equine Encephalomyelitis in Horses in the Fresh-Water Lake Area of Central Florida

Time by weeks (1952)	No. of cases
May 11 to 17	1
May 18 to 24	1
May 25 to 31	1
June 1 to 7	2
June 8 to 14	3
June 15 to 21	6
June 22 to 28	11
June 29 to July 5	12
July 6 to 12	7
July 13 to 19	7
July 20 to 26	11
July 27 to August 2	9
August 3 to 9	2
Total	73

until comatose, even while standing. If pushed, the animal will fall heavily and exhibit walking movements while down. Death usually occurs within forty-eight to seventy-two hours after the onset of symptoms, in contrast to western equine encephalomyelitis which is rarely fatal.

Encephalitic symptoms caused by botulinus toxins and the poisonous plant, Crotalaria, are similar; however, no marked rise in temperature occurs and sweating is more common in botulism. Crotalaria poisoning takes several weeks or months to kill an animal.

The areas surveyed showed a seasonal pattern of infections, the greatest number occurring during June and July. This same pattern has occurred for the past thirty years, according to practitioners in the state.*

*Drs. E. F. Thomas, Sarasota; Peter S. Roy, Jacksonville; and A. R. Matthews, Jacksonville.

TABLE 2—Distribution of Equine Encephalomyelitis in Horses for the Fresh-Water Lake Area of Central Florida, by County, from Reports of the Bureau of Animal Industry and Personal Interviews with Veterinarians

	No. of cases, BAI reports			No. of cases, personal interview			
County	June	July	Aug.	May	June	July	Aug.
Alachua	....	8	....	1	4	6	1
Brevard	....	....	....	....	....	1	....
Duval	....	3	....	....	1	7	....
Flagler	1	....	....	....	1	....	....
Hardee	....	....	....	....	....	2	....
Hernando	....	....	....	....	....	3	....
Lake	....	....	....	....	1	2	....
Marion	....	....	....	....	1	4	1
Nassau	....	....	....	....	2	1	....
Okeechobee	....	....	....	....	2	2	....
Pasco	....	....	....	....	2	3	....
Polk	....	....	....	1	....	1	....
Putnam	6	....	....	1	10	7	....
St. Johns	....	2	....	....	....	2	....
Sumter	....	....	....	....	....	3	....
Total	7	13	....	3	24	44	2

Prevention of the disease in horses is accomplished by immunizing them with killed virus suspension. None of the 73 cases reported had been vaccinated. Control of the disease by limiting mosquito production appears to be impractical at the present time because of the vast and often inaccessible breeding areas, frequent rains, and rank vegetation.

TABLE 3—Bureau of Animal Industry Reports on Counties Not Surveyed

County	June	July
Gadsden	1	....
Hillsborough	1	5
Holmes	6	7
Jackson	2	2
Jefferson	0	1
Leon	1	0
Orange	3	1
Sarasota	1	1
Volusia	0	1
Washington	0	2
Total	15	20

Human cases of equine encephalomyelitis have occurred in recent years and have been clinically diagnosed as the eastern type. Two human cases reported to the State Board of Health were not confirmed by laboratory tests.

Clinical cases in horses are not always reported. Frequently, the veterinarian fails to send in reports, and many farmers, having seen the disease often, feel competent to make a diagnosis without veterinary aid. Since no treatment has been successful in the case of eastern equine encephalomyelitis, the horse or mule is sent to a rendering plant, where no postmortem examination is made. Therefore, the figures given in this report are probably conservative.

SUMMARY

1) During an investigation in the fresh-water lake area of Florida, 73 cases of equine encephalomyelitis in horses, all fatal, were found. Two unconfirmed human cases were also reported.

2) The brain taken from a 9-month-old filly, showing typical symptoms of the disease, revealed the presence of eastern equine encephalomyelitis virus by animal-inoculation tests.

3) Eastern equine encephalomyelitis appears to be enzoötic in the fresh-water lake region of central Florida and has existed there for many years.

Activity of Dairy Cows During Estrus

EDMOND J. FARRIS, Ph.D.
Philadelphia, Pennsylvania

EXCITABILITY and increased activity in association with the period of estrus in the females of certain mammals is a known phenomenon.

Wang[6] showed that the activity cycle of the female white rat is closely correlated with the estrous cycle, the peak of activity coinciding with the height of estrus, as verified by vaginal smears and mating tests. Slonaker *et al.*[5] showed that the peak of the rat's activity curve corresponded with the vaginal cornified cell stage, at which time the female accepted the male. Farris[3] used an automatic recording system to demonstrate that estrus in the Wistar rat was characterized by a burst of running activity which coincided with different stages of estrus, during which the female's receptivity to coitus was noted.

Altman[1] showed that sows in estrus manifested twice the normal activity. In most cases, the increase in activity continued for one to three days prior to the sow's return to normal nonestrous activity.

Bond[2] found activity of a four-day cyclic nature, which may correspond to the estrous cycle in the female golden hamster, described as associated with the four-day cycle characteristic of the species.

Farris[4] demonstrated a cyclic variation in the walking activity of women. Three activity peaks were noted during the menstrual cycle: *(a)* during the menses; *(b)* during the period of ovulation; and *(c)* a late peak on about the twenty-fourth day of the cycle.

The object of this study was to observe the increase in the cow's activity during the estrous period

MATERIALS AND METHODS

To determine the activity of cows, a New Haven pedometer recorded the number of steps taken by the animal. The instrument was mounted in a flat wooden block (fig. 1) with an impression which carried the pedometer. The metal cover, hinged below and secured above with a wing nut, held the instrument in place. A plastic sheath enveloped the instrument, to protect it from moisture. A wide leather band, which held the instrument, was buckled in place on the medial aspect of the cow's left hind leg above the fetlock. The unit was painted red for identification if lost in the pasture.

A herd of Guernsey cows belonging to the School of Veterinary Medicine of the University of Pennsylvania was employed for the experiments. The cows were kept in the barn for milking between 4:00 to 5:00 a.m. and again at 4:00 to 5:00 p.m., at which times the pedometer records were obtained.

The activity records were obtained before, during, and after estrus. The findings are presented in four tables, according to the different patterns of activity exhibited by the cows. Morning and evening readings, together with the total 24-hour activity record are presented for each cow, as well as a group mean, in table 1. Tables 2, 3, and 4 record the 24-hour activity data only.

RESULTS

Table 1 shows the activity of 6 cows before, during, and following estrus. All of these animals, maintained out of doors except during milking, showed an increased estrous activity lasting approximately twenty-four hours. The morning activity

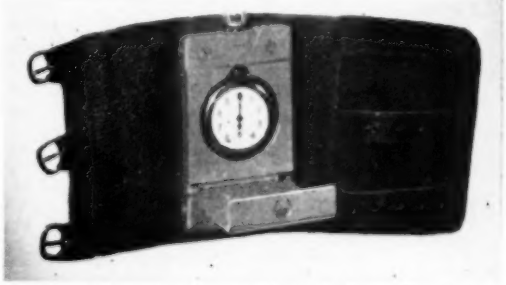

Fig. 1—Pedometer mounted in holder. The instrument is strapped in place on the left leg to record the cow's activity.

From the Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

This investigation was aided by a grant from the Samuel S. Fels Fund.

The author expresses his appreciation to Jonathan H. Adler, who took many of the activity recordings while a senior in the School of Veterinary Medicine, University of Pennsylvania, and to the other veterinary students who participated in other similar experiments; to Dr. Thomas DeMott, in charge of Bolton Farm, and Mr. J. Hague, the herdsman, for their coöperation; and to the University of Pennsylvania for the use of the Guernsey herd, made available through the kindness of Dean Mark Allam.

TABLE I—Activity of Cows Before, During, and Following Estrus

Name of cow	Days before estrus 5	4	3	2	1	Day of estrus	Days following estrus 1	2	3	4	5
Morning readings recorded between 5:00 p.m. and 4:00 a.m.											
Prejudice	4.5*	4.4	6.4	3.3	5.4	11.0	4.8	2.5	4.8	5.8	....
Noel	4.0	1.8	4.5	3.7	3.8	9.2	3.3	3.8	3.2	3.4	1.6
Verlinda	....	....	....	....	4.0	4.6	1.5	4.3	2.9	4.2	1.5
Suzanna	....	4.0	3.8	2.2	3.6	11.0	3.8	....	....	....	....
Ilex	....	2.5	2.8	2.0	3.0	8.0	3.3	3.8	3.6	2.3	....
Lightstar[1]	3.75	3.4	3.4	2.0	2.0	8.5	2.7	3.35	1.8	1.9	0.7
Lightstar[2]	0.5	3.3	1.0	3.5	3.0	3.3	3.5	....	....	....	....
Mean	3.2	3.2	3.7	2.8	3.5	7.9	3.3	3.6	3.2	3.5	1.3
Evening readings recorded between 5:00 a.m. and 4:00 p.m.											
Prejudice	6.1	6.5	10.8	8.9	6.5	9.2	3.6	2.1	8.0	8.2	....
Noel	7.6	5.8	5.4	6.3	5.0	6.2	5.8	5.0	6.2	5.5	3.8
Verlinda	....	....	....	....	2.6	8.1	5.3	2.3	2.3	2.0	2.5
Suzanna	....	5.4	6.6	6.2	4.4	11.3	4.3	....	....	....	....
Ilex	....	5.3	7.2	5.3	4.2	9.0	4.6	7.1	7.0	6.5	....
Lightstar[1]	4.7	4.75	3.85	4.8	3.7	7.3	3.85	7.0	5.25	3.7	1.0
Lightstar[2]	0.1	2.2	6.25	6.1	5.8	10.3	0.8	....	....	....	....
Mean	4.6	5.0	6.7	6.3	4.6	8.8	4.0	4.7	5.8	5.2	2.4
Total activity readings 24 hours											
Prejudice	10.6	10.9	17.2	12.2	11.9	20.2	8.4	4.6	12.8	14.0	....
Noel	11.6	7.6	9.9	10.0	8.8	15.4	9.1	8.8	9.4	8.9	5.4
Verlinda	....	....	....	....	6.6	12.7	6.8	6.6	5.2	6.2	4.0
Suzanna	....	9.4	10.4	8.4	8.0	22.3	8.1	....	....	....	....
Ilex	....	7.8	10.0	7.3	7.2	17.0	7.9	10.9	10.6	8.8	....
Lightstar[1]	8.5	8.2	7.3	6.8	5.7	15.8	6.6	10.4	7.1	5.6	1.7
Lightstar[2]	0.6	5.5	7.3	9.6	8.8	13.6	4.3	....	....	....	....
Mean	7.8	8.2	10.4	9.1	8.1	16.7	7.3	8.3	9.0	8.7	3.7

All cows were maintained out of doors except during milking.
*1.0 = 1,000 steps. [1]First estrus; [2]second estrus.
Activity records of 6 cows during seven heat periods; all showed an increased estrous activity for approximately twenty-four hours.

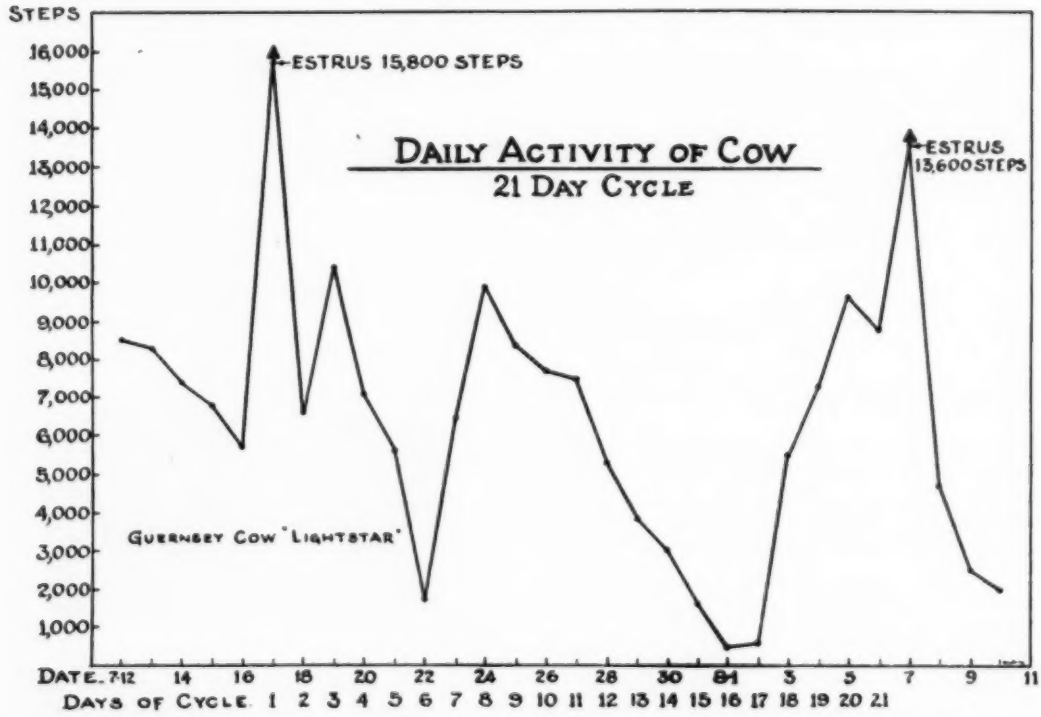

Fig. 2—Activity record of cow, Lightstar, showing increased activity during two estrous cycles. During the first estrus, the cow took 15,800 steps; during the second, 13,600 steps.

TABLE 2—Activity of 2 Cows Before, During, and Following Estrus

Name of cow	Days before estrus 5	4	3	2	1	Day of estrus	Days following estrus 1	2	3	4	5
Total activity readings 24 hours											
Flo	6.8†	11.4	8.5	10.0	9.2	8.8*	0.4	6.3	6.6	6.3	3.0
Modesty	....	7.3	8.8	9.3	8.2	14.0**	9.6	8.1	10.8	8.6	10.6
Mean	....	9.35	8.65	9.79	8.7	11.4	5.0	7.2	8.7	7.45	6.8

*Kept in barn six hours following insemination, conceived. **Kept in barn twelve hours following insemination, conceived. †1.0 = 1,000 steps.

Increase in estrous activity which lasted approximately twenty-four hours in 2 cows. A pre- and post-estrous dip in activity was evident. Both cows were kept in the barn following insemination.

records showed a mean of 7.9 pedometer units; the evening readings, a mean of 8.8 pedometer units. The 24-hour total was 16.7 pedometer units. The evening readings the day before and the day following estrus showed a characteristic drop in activity, as did the mean for the 24-hour period.

One cow, "Lightstar," was observed through two heat periods. Figure 2 shows her activity record throughout a 21-day cycle. The first estrus revealed activity of 15,800 steps, while the second showed a peak of 13,600 steps.

Table 2 shows the activity records of 2 cows before, during, and following estrus for approximately 24-hour periods. Both cows were inseminated during clinical estrus and kept in the barn for six and twelve hours, respectively. The activity records are, therefore, incomplete.

The 2 cows showed a mean activity of 11.4 pedometer units on the day of estrus. The day before and following estrus, they showed a reduced activity of 8.7 and 5.0 pedometer units, respectively.

Table 3 shows the activity record of 3 cows before, during, and following the heat period. In these animals, estrus lasted approximately forty-eight hours. Clinical signs of estrus appeared on the second day of the increased activity. The animals were inseminated on this day, and all conceived. These cows were kept in the barn for six to twelve hours following insemination and, therefore, the activity records are incomplete.

The total 24-hour readings on the day of clinical estrus showed a peak of activity to 13.5 pedometer units, with 9.3 pedometer units on the preceding day. A characteristic dip preceding and following estrous activity was evident, as indicated by the 6.7 and 7.4 pedometer units, respectively.

Table 4 shows, in 2 cows, a prolonged activity period of three and four days associated with estrus. "Queenie" showed a three-day activity peak, while "Iris" showed a four-day activity increase. "Iris" was inseminated on the second day of activity, and conceived.

DISCUSSION

Eleven of the 13 cows studied began their increase in estrous activity between 5:00 p.m. and 4:00 a.m. The degree of activity progressed between 5:00 a.m. and 4:00 p.m., in most cases.

Increase in activity during estrus was observed in all of the cows. Clinical signs of heat coincided with the increase in activity usually within one day. Reduction in activity was evident the day prior to,

TABLE 3—Activity of Cows Before, During, and Following Estrus

Name of cow	Days before estrus 5	4	3	2	1	Day of clinical estrus	Days following estrus 1	2	3	4	5	Remarks
Total activity readings 24 hours												
Janella	7.3**	4.9	3.7	2.5	9.3	15.8*	7.2	6.8	8.5	....	....	Estrus, 48 hours
Meha	4.3	5.9	6.1	6.1	8.0	11.5*	7.0	6.5	8.0	7.6	9.0	Estrus, 48 hours
Starlight	11.2	11.2	12.4	8.6	10.7	13.2*	8.1	11.2	9.4	9.0	8.8	Estrus, 48 hours
Mean	7.6	7.33	7.4	6.7	9.33	13.5	7.41	8.17	8.63	8.3	8.9	.....

*Day of insemination. **1.0 = 1,000 steps.

Table 3 summarizes the activity readings of 3 cows during estrus. They showed an increased estrous activity lasting approximately forty-eight hours. The 3 cows were inseminated on the second day of increased activity, which coincided with the clinical signs of estrus. Following insemination, the cows were all kept in the barn approximately six to twelve hours. All cows conceived.

TABLE 4—Activity of 2 Cows Before, During, and Following Estrus

Name of cow	Days before estrus 5	4	3	2	1	Day of clinical estrus	Days following estrus 1	2	3	4	5	Remarks
Total activity readings 24 hours												
Queenie	....	....	....	9.4	9.3	13.1	10.4	17.3	5.3	9.8	8.2	Estrus, 72 hours
Iris	11.2	10.0	10.1	10.8	12.4	13.3*	16.3	13.2	6.0	7.4	8.2	Estrus, 96 hours
Mean	....	....	....	10.1	10.9	13.2	13.3	15.2	5.6	8.6	8.2	.....

1.0 = 1,000 steps. *Inseminated and kept in stall all day, conceived.

Table 4 summarizes the records of 2 cows that showed an increased estrous activity of seventy-two and ninety-six hours, respectively.

and following, the increase in estrous activity.

SUMMARY

A method is presented for recording the activity of cattle.

The estrous period in dairy cows is characterized by increased activity, usually preceded and followed by a dip in the 24-hour activity record.

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Interrupting Pregnancies.—The pregnancies of 12 bitches and 3 cats were interrupted in Russia by the subcutaneous injection, on alternate days, of 2.5 mg. of diethylstilbestrol in oil in the bitches and 1.0 mg. in the cats. Injections were started on the sixth or seventh days after mating. —*Vet. Bull., April, 1954.*

Notes on Parturient Paresis

Reduced Blood Calcium.—The central depression and motor paralysis of parturient paresis in cows appears to be due to a reduced blood calcium level, the cause of which is still unknown but which may be the result of citrate or similar anions formed in the mammary gland when lactation is initiated. Cases may be classified as: subclinical which are transient and may not go down; typical which respond promptly to calcium therapy; relapsing which may require two or more treatments before recovery; and severe, in which recovery is partial but serious damage to parenchymatous organs (especially the heart and kidneys) may prevent recovery.—*California Vet., Jan., 1954.*

Lowered Activity of Adrenal Cortices.—In Sweden, the urine of cows with parturient paresis was compared with that of normal cows in the last month of gestation, just after calving, and four to eight weeks after calving. In cows with parturient paresis, the corticoid secretion was less than one third of normal, the steroids slightly less than normal. This implies a greatly lowered activity of the adrenal cortex similar to that in the coma of Addison's disease in man or in eclampsia of women.

In normal cows, the adrenal cortical activity is increased throughout pregnancy (due to stress), as indicated by the high urinary excretion of corticoids and neutral steroids, but after parturition these eventually return to the nonpregnant level. In cows with parturient paresis, the fall is much more abrupt, as if the cortical reserves of the adrenal gland were depleted. This could be associated with the sudden high activity of the udder combined with other predisposing factors.

The adrenal cortex is capable of rapid response to stimulation but the role of calcium therapy is difficult to explain. The drain of blood calcium in the production of colostrum does not seem to be the primary cause of milk fever.—*Brit. Vet. J., Sept., 1953.*

Stilbestrol, 15 to 30 mg., given to a bitch soon after mismating will prevent conception.—*L. E. Harris, Ph.D., Nebraska.*

Some Neoplasms of Captive Wild Animals

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THE PATHOLOGY of zoo animals represents an extremely fascinating phase of veterinary medicine. Surely the care and treatment of captive wild animals should be included in the realm of our profession. The purpose of this paper is to describe a few neoplasms of zoo animals from the author's collection.

Unfortunately, neoplastic diseases of wild animals have not been reported in detail to any great extent. However, no animal, domestic, captive, or wild, is immune to tumors. It has been estimated that tumors occur at the rate of one for every 60 zoo animals.

Probably Fox[1] has contributed more to our knowledge of wild animal diseases than any other pathologist. Over a span of nearly twenty years, he reported 92 tumors in 5,365 animals, or one tumor in every 58 specimens. His records indicate that neoplasms develop at least twice as often in captive mammals as in birds. Rodents have the highest incidence of tumors with marsupials and carnivores next in order, respectively.[1] Strangely enough, primates have the lowest incidence. However, Fox describes a papillary adenoma of the gastric mucosa in a Hamadryas baboon.[1] More recently, O'Connor[2] reported a fibrosarcoma of the breast in a green monkey as well as an adenocarcinoma of the small intestine in a ringtail monkey.

Psittacine birds are especially prone to tumors of the kidney region and neoplasms of the pituitary gland are not uncommon in parakeets.

According to Ratcliffe,[3] the incidence of tumors in captive wild animals is dependent upon the average age of the group and their susceptibility to neoplasia. As age increases, tumor-incidence increases. Moreover, the epithelial tissues of the digestive organs in mammals are more subject to tumor formation than other body parts. Zoo pathologists feel that long captivity allows tumor-tendency to express itself, but

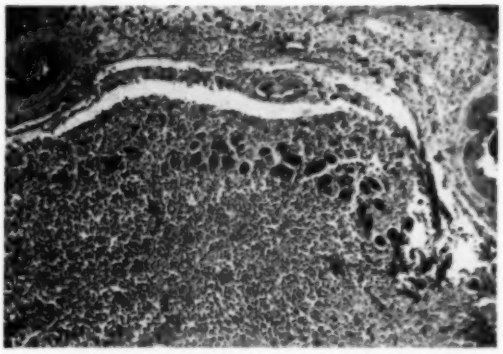

Fig. 1—Microphotograph of an osteochondrosarcoma from the back of an African black cobra, showing chondrogenesis with both immature and adult chondroblasts.

confinement does not necessarily increase the incidence of tumors.[2] The only clear case of long life and high tumor incidence is found in parrots. Since inbreeding probably occurs in wild animals, tumor-tendency is possibly transmitted as a dominant character.[2]

Many months ago, the author invited several zoological gardens to submit tumor specimens from captive wild animals to him for study and diagnosis. Dr. Patricia O'Connor, veterinarian for the Staten Island Zoo, submitted most of the specimens in the author's collection. Well over a year ago, she removed a tumor from the left lateral and ventral surfaces of the prepuce of a 9-year-old Shetland pony. The entire

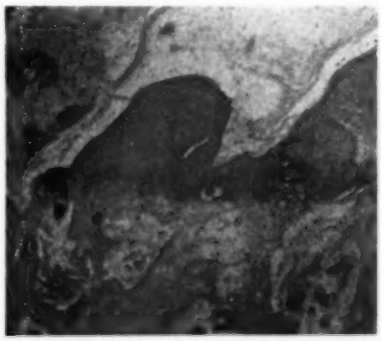

Fig. 2—Microphotograph of a subcutaneous fibrosarcoma of the neck region of a diamondback rattlesnake, revealing a fibroblastic mass and a normal pigmented epidermal layer of keratinized cells.

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mass was as large as a grapefruit. Its surface was rough, irregularly lobulated, firm, and grayish white. Microscopic studies revealed it to be an epidermoid carcinoma. These neoplasms, also known as pearl cell carcinomas, often involve the external genitalia.

few tumors of snakes have been reported in detail, as shown by table 1.[4] The first snake tumor submitted from the Staten Island Zoo was attached to the dorsal aspect of the spinal column in an African black cobra. Only a portion of the body of the 8-foot, 10-year-old snake was sent for examination.

TABLE 1—Neoplasms of Snakes

Snake	Tumor	Site	Author
Python	adenocarcinoma	ovary	Bland-Sutton, 1885
Python	cyst adenoma	stomach	Vaillant and Pettit, 1902
Ring snake	adenocarcinoma	kidney	Patay, 1933
Say's pine snake	adenocarcinoma	pancreas	Ratcliffe, 1935
Water snake	papillary carcinoma	bile duct	Bergman, 1941
Pine snake	melanosarcoma	skin	Ball, 1946
Pine snake	melanosarcoma	labial folds	Ball, 1946
	rhabdomyoma	palate	Ball, 1946
Prairie rattlesnake	fibrosarcoma	retropharyngeal area	Ball (not published)
Coachwhip snake	adenocarcinoma	abdominal cavity	Ball (not published)
Python	melanoma	skin	Schlumberger and Lucke, 1948
Python	melanoma	skin	Lucke and Breedis (not published)
Black cobra	osteochondrosarcoma	spinal column	Wadsworth, 1954
Diamondback rattlesnake	fibrosarcoma	neck	Wadsworth, 1954
Western hognose snake	sarcoma (unidentifiable cell type)	cloaca	Wadsworth (not published)
Canebrake rattlesnake	adenocarcinoma	intestine	Wadsworth (not published)

A lesser sulfur-crested cockatoo from the Staten Island collection died in January, 1952, and was submitted to the author. It was an aged bird and had been in captivity for over ten years. A few days previous to death, an attempt was made to remove some tumor tissue from under the eye. At autopsy, a large, subcutaneous neoplasm was identified in the lower cervical region. The whitish growth measured about 1.5 cm. in diameter and was attached to a blood vessel wall. It proved to be an angiosarcoma.

Last fall (1953), Dr. W. M. Strawn, veterinarian for the Toledo Zoo, sent the author a portion of a tumor removed from a female Zebu or Brahma cow known to be over 12 years old. The animal had calved about six weeks previously, became sick shortly after parturition, and showed some diarrhea. She partially regained her normal appetite, but refused to eat during the last week of her life. At necropsy, a massive growth was discovered in the right posterior portion of the abdominal cavity. It extended into the mesentery and had grown solidly around the loops of the small intestine. It weighed about 20 lb. and was greasy to the touch. Histopathological examinations revealed it to be a lipoma.

Serpentine tumors represent an interesting phase of zoo pathology. Surprisingly Neoplasia was suspected four years previously when a bony growth appeared about 36 inches back from the snout. It was a lobulated, walnut-shaped, osseous mass measuring 3.0 by 2.5 by 2.0 cm. Microscopic studies showed it to be an osteochondrosarcoma (fig. 1).

Another serpentine tumor from a western diamondback rattlesnake was studied last year. This individual had appeared on television, in *Life* magazine, and had traveled over 10,000 miles with the curator of reptiles of the Staten Island Zoo on his lecture tours. The snake had bloody stools for about two weeks before death, and the tumor was revealed at necropsy. It had appeared as merely a localized thickening of the subcutaneous tissues in the neck region. Histopathological studies revealed it to be a fibrosarcoma (fig. 2). More recently, the author has diagnosed two more serpentine tumors from the Staten Island Zoo collection. One was a sarcoma of an unidentifiable cell-type in a western hognose snake, and the other an adenocarcinoma of the intestine in a canebreak rattlesnake.

SUMMARY

A few neoplasms collected from captive wild animals are described. It is felt that zoo pathology, particularly tumors, is an intriguing but neglected phase of veteri-

nary medicine. More case reports are needed to stimulate a professional interest in the diseases of captive animals.

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Inverted Cecum in a Dog

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Inversion of the cecum probably occurs infrequently in the dog. I found only two reports of cases in the literature[1,2] and observed its occurrence in one instance. In the 2 cases reported in the literature, the cecum in each instance protruded through the anus during and immediately following defecation, but the true character of the condition was not identified until after surgical exploration of the abdomen. In the case which I observed, the cecum at no time protruded through the anus nor could it be palpated by inserting a finger into the rectum. In this instance, the inversion of the cecum produced symptoms suggestive of partial obstruction of the rectum. The following is a detailed report of the symptoms observed and the condition found at necropsy.

REPORT OF CASE

A female black Labrador Retriever was owned by me and was under my care and observation from the time she was 5 weeks of age until her death at 11 years. Her hunting career began when she was 7 months of age. At that time, she was about fully developed and seemed normal physically and mentally, but on her first day in the field hunting pheasants it was noted that the dog had too frequent bowel movements. They occurred at intervals of twenty to thirty minutes. The feces passed at the first two or three bowel movements were formed and appeared normal, but each succeeding stool became less in quantity, more liquid, and contained an increasing amount of blood. At the termination of the hunt, the stools consisted almost entirely of blood.

Since this dog had received a generous amount of food in the morning, it seemed logical to attribute the too frequent bowel movements and blood in the stool to overfeeding and the excitement and strenuous exercise associated with the first hunt. Therefore, the next time this dog was used for hunting, she was given only a small amount of food in the morning, but the results were the same as those noted previously. Withholding all food, as well as changing to a low-residue ration, was likewise ineffective in correcting the condition. As the dog aged, she became somewhat less

Fig. 1—The colon has been incised to show the inverted cecum projecting down into it.

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excitable when hunting, but the tendency for too frequent bowel movements, excessive straining during defecation, and the passage of liquid stools with varying amounts of blood persisted throughout her life.

Physical examination and roentgenograms of the abdomen without administration of a barium meal were negative. Surgical exploration of the abdomen was often considered, but because this dog was my hunting companion and because she seemed quite comfortable when not hunting, it was easy for me to dissuade myself from performing this operation. The true nature of the dog's ailment, therefore, was not learned until the animal came to necropsy after having lived with the ailment for eleven years. At necropsy, it was found that the cecum was inverted and projected into the colon (fig. 1). It caused partial obstruction of the colon and rectum and was the cause of the excessive straining when defecating, while erosions in the mucosa accounted for the blood noted in the stool.

The condition could easily have been corrected by surgical treatment. This case illustrates the value of surgical exploration of the abdomen when symptoms suggesting an abdominal ailment are noted and a diagnosis can not be made by the usual methods of examination.

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Hysterectomy is the preferred treatment for canine pyometra. It is also indicated when a bitch has experienced a second pseudocyesis.—*T. H. Brasmer, D.V.M., Illinois.*

Stilbestrol-Induced Lactation

About 40 virgin, yearling goats were injected subcutaneously three times a week with 0.5 mg. of diethylstilbestrol for about fifty days. They were milked as soon as secretion was present. Some commenced milking after the fourth or fifth injection and gradually increased the quantity of milk to 3 lb. or more by the second month. Others gave little or no response. A few uninjected controls also developed milk. About half of those treated gave from 50 to 360 lb. of milk during the artificially induced lactation.

In a later natural lactation, most of the same goats produced from 500 to 1,500 lb. of milk. The injections and the pre-breeding lactation had little, if any, effect on their later estrus and breeding.—*J. Dai. Sci., Oct., 1953.*

Effect of Castration on Growth.—When 20 boar pigs were castrated at sizes varying from 40 to 180 lb., there was no significant difference in the rate of gain or feed efficiency. Pork from the uncastrated group was inferior in all respects. Objectionable odor or flavor was not found in animals castrated more than five weeks prior to slaughter.—*J. Anim. Sci., Feb., 1954.*

Expulsion of an Intussusceptum

An aged, hospitalized man developed a gastrointestinal complication which terminated several days later when he passed a blackened tubular, macerated piece of tissue measuring 45 cm., which proved to be a segment of the ileum. Laparotomy indicated that a spontaneous amputation of the intussusceptum and an autoanastomosis had occurred. After resection of the involved ileum and a side-to-side anastomosis, the patient recovered.—*Am. J. Surg., Jan., 1954.*

Efocaine Anesthesia.—In a controlled series of anorectal operations, there seemed to be no difference in the postoperative pain when efocaine anesthesia was used, but troublesome side actions occurred in a number of cases. Regret is expressed that this drug was publicized in the lay press before it was properly evaluated.—*J.Am.M.A., May 15, 1954.*

Surgery in Contaminated Wounds

Every open wound needs surgery. Either it should be closed by suture or skin graft or it needs debridement to prevent or eliminate sepsis and to prepare it for closure. The spotlight should fall on the pathological process rather than on the bacterial flora. Dead tissues should be excised and dead space obliterated or drained. Atraumatic technique, pressure dressings, and antibiotic therapy are valuable adjuncts.—*J.Am.M.A., April 17, 1954.*

CLINICAL DATA

Clostridium Perfringens Type C in Hemorrhagic Enterotoxemia of Lambs

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AN ACUTE infectious disease of newborn lambs, apparently caused by the *Clostridium perfringens* type C toxin, has recently been encountered in Colorado.

REVIEW OF LITERATURE

McEwen and Roberts[1] in 1931 described a disease of sheep from the Romney Marsh in England which they called "struck." McEwen isolated a microörganism of the Welch group, which was designated *Bacillus paludis*. Later, *B. paludis* became type C in the Wilsdon[2] classification of *Clostridium welchii*. Apparently, struck is an enterotoxemia-like disease of mature sheep due to *Cl. perfringens* type C rather than type D. On farms in Britain where type C causes an enterotoxemia, it affects adult sheep only.

Newsom,[3] in his discussion of lamb dysentery, states: "Lamb dysentery is a highly fatal disease occurring during the first four days of life and distributed throughout the world wherever sheep are raised. In Great Britain the disease has been investigated by Gaiger and Dalling (1921) who first attributed it to a combination of the colon bacillus and a member of the Welch group, and later concluded that only the Welch organism was the etiological factor. This they called the L. D. bacillus and showed that it differed essentially from the classical *B. welchii*. Wilsdon (1931) called this organism type B in his classification which was based on the toxic constituents."

In 1940, Tunnicliff[4] examined 3, 4-week-old lambs which died suddenly. No gross lesions were observed in 2; the third lamb showed a darkened bloody intestine, chiefly in the posterior half of the small intestine and colon. From the outside of the intestine, the contents appeared chocolate colored. The mucosa was darkened and had extensive yellow necrotic areas on the surface. *Clostridium perfringens* type C was isolated from this animal.

Griner and Bracken[5] reported the occurrence of *Cl. perfringens* type C in hemorrhagic enteritis in infant calves.

OCCURRENCE

In April, 1953, a large sheep and cattle ranch (herd A on which the authors made observations for this report) in central Colorado encountered excessive mortality of newborn lambs. This ranch was located at an elevation of 8,800 to 9,000 ft. and consisted primarily of mountain meadow and open grass ranges. A herd of 15,000 to 16,000 ewes were lambed in sheds or on the open range. At the same time, a second sheep ranch (herd B), approximately 100 miles to the north, reported losses of newborn lambs. This ranch was approximately 1,000 ft. lower in elevation, but otherwise was similar in geographical and ecological environment. At the time of lambing, most of the snow had disappeared from the ranges, but the weather remained cold and windy.

Due to the uncertainty of weather at these elevations, closed sheds were used for lambing. Some attempts at heating the sheds were made during severe weather. These sheds contained several rows of individual lambing pens which were approximately 4 ft. square.

Geographical observations have been made on only two sheep ranches which were located at a higher elevation.

One case of hemorrhagic enterotoxemia produced by *Cl. perfringens* type C was found in a lamb at the Colorado A. & M. veterinary research unit at Fort Collins. It occurred in a lamb from a ewe that had just been moved to the unit from a Wyoming ranch.

Hemorrhagic enterotoxemia occurred in lambs twelve to seventy-two hours after birth. The daily incidence of the disease varied from 12 to 20 per cent in herd A.

SYMPTOMS

The symptomatology of hemorrhagic enterotoxemia was not pathognomonic. Few symptoms other than early rapid death were observed. The lambs became weak, prostrate, and died. No temperature rise was

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noted; more frequently, subnormal rectal temperatures were found. Shivering, bleating, and other signs of chilling were frequently seen. This was followed by prostration, tetanic and toxic spasms, and death.

—Rue Jensen, Colorado A. & M. College

Fig. 1—Hemorrhagic enterotoxemia in a day-old lamb, showing extensive hemorrhagic lesions of the intestine.

NECROPSY FINDINGS

The gross lesions at autopsy were primarily hemorrhagic in character; the most marked pathology observed was the extensive necrohemorrhagic enteritis. Portions of both the large and small intestines were found to be hemorrhagic (fig. 1). The lumen of the intestine contained considerable blood and dead mucous membrane. Ecchymotic subserosal hemorrhages were also observed on the coiled colon (ansa spiralis), cecum, and small intestine. Serohemorrhagic lymphadenitis of the mesenteric lymph nodes was found. Hemorrhages were also observed on the thymus and diaphragm. The pericardium contained excessive fluid, portions of which were clotted. The lungs showed moderate congestion. Serous lymphadenitis of the thoracic lymph nodes was observed. The abomasum was distended with large quantities of milk, only a small portion of which had coagulated. The mucous membrane of the abomasum was hyperemic and was coated with a thick layer of tenacious mucus.

HISTOPATHOLOGY

The most marked histopathological changes were observed in the large and small intestines. Intestinal lesions varied from catarrhal enteritis and intense hyperemia of the mucosa to extensive necrosis of the mucous membrane and lamina propria. Frequently, the intestinal villi were almost completely destroyed. In many sections, the necrotic process had extended to the muscularis mucosae. The lumen of the intestine contained fragments of dead villi, debris, whole and hemolyzed erythrocytes, polymorphonuclear leukocytes, and many bacteria. Gram-positive bacilli, occurring singly or in short chains, were the dominant bacterial organisms. Varying degrees of edema, distention of the lymphatics, vascular congestion, and hemorrhage were observed in the submucosa of the intestine.

An occasional hemorrhage was also observed in the muscularis and subserosa. Histopathological changes in the abomasum were limited to catarrhal abomasitis and edema of the submucosa. The mesenteric lymph nodes were edematous and hyperemic, the lymph spaces being filled with fluids and erythrocytes, and the lymph sinuses were distended. Subepicardial and focal myocardial hemorrhages were seen in the heart.

Liver sections were characterized by central congestion and cloudy swelling of the hepatic cords. Frequently, the sinusoids were obliterated by the swollen parenchymal tissue. Considerable pigmentation of the cytoplasm was also observed.

Microscopically, the kidneys showed areas of hyperemia and hemorrhage scattered throughout the parenchymal and stromal tissues. The epithelium of the convoluted tubules was swollen and the cytoplasm showed considerable granulation.

SEROLOGICAL FINDINGS

Direct smears of intestinal content indicated that the dominant organisms were medium-sized, gram-positive bacilli morphologically resembling *Cl. perfringens*. The isolation and cultural methods described by Griner and Bracken[5] were employed in this study.

Intravenous inoculation of filtrates prepared from intestinal contents of 7 lambs dead from hemorrhagic enterotoxemia were toxic to mice. These filtrates, when heated to 60 F. for fifteen minutes, lost their toxic properties.

Clinical examinations of the sick and dying lambs of herd A indicated that death resulted from an enterotoxemia, probably caused by *Cl. perfringens* type D toxin. Therefore, 175 lambs were treated with 5 cc. of type D *Cl. perfringens* antiserum sub-

cutaneously, but without beneficial results. The death rate in the treated lambs was the same as in the controls, an average daily mortality of about 12 to 14 per cent.

TABLE I—Prophylactic Use of Clostridium Perfringens Type C Antitoxin in Hemorrhagic Enterotoxemia

Lot	Total lambs	Lambs treated		Lambs untreated	
		Survived	Died	Survived	Died
1	223	109	1	104	9
2	320	320	0	.....	...

Field investigations which indicated that an enterotoxemia existed in these lambs were later confirmed by laboratory tests which showed that *Cl. perfringens* type C toxin was the etiological agent producing the disease.

Neutralization studies against types A, B, C, and D *Cl. perfringens* antitoxin were made on all intestinal filtrates prepared from lambs dead of this disease. In all cases, it was found that types B and C antitoxin neutralized the toxin.

To each of four tubes containing 1 cc. of filtrate was added 0.5 cc. of antitoxin. Tube 1 received type A, tube 2 received type B, tube 3 received type C, and tube 4 received type D antiserum. These mixtures of toxin and antitoxin were incubated at room temperature for forty-five minutes. Three mice were inoculated intravenously with 0.1 to 0.15 cc. of each toxin-antitoxin mixture. All mice receiving mixtures containing filtrate and types A or D antiserum died within thirty minutes, while no reaction was noted in those mice receiving toxin and type B or type C antitoxin. This indicated that the toxic substance in the intestinal contents was the *beta* toxin of type C *Cl. perfringens*. Filtrates of broth cultures of the *Cl. perfringens* organisms isolated from lambs were also found to contain *beta* toxin.

The prophylactic efficacy of *Cl. perfringens* type C antiserum was tested, using antiserum which was supplied by Dr. R. M. Montgomerie of the Wellcome Research Laboratories, Beckenham, Kent, England.

On April 14, 1953, 223 lambs 12 to 24 hours old were selected at random. One lot of 110 lambs received 3 cc. of type C antiserum subcutaneously. The remaining 113 lambs served as untreated controls (table 1). All lambs remained with their dams in individual lambing cells for twenty-four hours, after which all dead lambs were removed and autopsied. One treated lamb had died of a navel infection, while 9 of the untreated controls had died from hemorrhagic enterotoxemia. On April 15, 320 newborn lambs were each given 3 cc. of type C antiserum subcutaneously. The owners later reported that the antiserum was about 100 per cent effective in preventing the disease. In order to test the therapeutic value of the antiserum, 14 sick lambs, all of which were scouring and passing some blood in the feces, were selected and each lamb received 5 cc. intraperitoneally. Thirty hours later, 5 of the treated lambs were dead and the remaining 9 had recovered.

SUMMARY

1) An acute infectious disease of newborn lambs, apparently caused by *Clostridium perfringens* type C toxin, is described.

2) The disease is characterized by sudden onset, early death and, at necropsy, a severe hemorrhagic enteritis.

3) *Clostridium perfringens* type C toxin apparently has a strong necrotizing action upon the intestinal mucosa.

4) Evidence is presented which would indicate that *Cl. perfringens* type C antitoxin is of prophylactic value.

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The Use of Phenylbutazone (Butazolidin) in the Treatment of Posterior Paralysis and Arthritis in Dogs

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PHENYLBUTAZONE (butazolidin®) is a totally new orally effective compound with an exceptionally broad field of usefulness in the treatment of arthritis and allied disorders. It is one of a group of pyrazole derivatives developed in 1946* during the search for a drug with the therapeutic properties of aminopyrine but without its toxicity. Chemically, it is 3,5-dioxo, 1,2-diphenyl-n-butyl pyrazolidine.

LITERATURE CITED

In experimental animal studies,[1,2] this compound manifested strong analgesic and antipyretic properties. In addition, it exercised a potent "anti-inflammatory" effect both in delaying and minimizing local tissue reactions produced by chemical and physical irritants. Thus, its potentialities in the field of painful musculoskeletal disorders appeared therapeutically sound. Broad clinical investigations[3-5] in the United States and Great Britain in the field of human medicine have found the range of usefulness of this drug in the following conditions: gouty arthritis, rheumatoid arthritis, osteoarthritis, psoriatic arthritis, spondylitis, fibrositis, myositis, neuralgia, sciatica, and scapulohumeral periarthritis.

The purpose of this report is to illustrate clinical findings in about 30 dogs having posterior paralysis (more recently described as the "vertebral disc syndrome"), painful fractures, arthritis, and painful injuries to the limbs and joints. The results have been as satisfying as those reported in similar conditions in man. Phenylbutazone has not affected the posterior paralysis which has been diagnosed as postencephalitic (distemper).

CASE REPORTS

The following case reports will illustrate the typical responses to this compound:

Case 1.—On May 13, 1953, a 2-year-old, male Scotch Terrier-type dog was hospitalized after having been struck by a car. A roentgenogram revealed multiple fractures of the pelvis. The fragments were not manipulated. The animal, sustained with saline-dextrose infusions for three days, appeared brighter and ate small amounts of food, but was unable to rise on his hind legs.

On June 8, the dog was sent home to have more familiar care and nursing. On June 11, the owner reported that he had poor success in getting the animal to eat, and that any movement or slight attempt to move caused the patient extreme pain. Therefore, one phenylbutazone (100 mg.) tablet was administered three times daily for three days. The owner then reported that his dog "had taken a new lease on life" and was able to move and make attempts to rise without pain. The dog's appetite immediately improved, probably due to the relief from pain. On June 15, the dose was reduced to two 100-mg. tablets daily. The dose was subsequently reduced to one tablet daily as the animal continued to progress toward an uneventful recovery. Medication was discontinued on June 30. On July 18, the dog could walk well but with an awkward gait.

Case 2.—On Nov. 19, 1953, a 6-year-old spayed female Cocker Spaniel-type dog, weighing 35 lb., was observed with the syndrome of posterior paralysis. Despite the sudden onset, there was no history of trauma. The disposition of the animal did not permit oral medication, so the owner insisted on hospitalization of the patient. Intravenous medication, on alternate days, of calcium gluconate solution and vitamin B brought no relief. The owner, on November 23, consented to treatment at home and four phenylbutazone tablets (100 mg. each) were given daily. On the fourth day of this therapy, the dog could stand on its hind legs with some assistance in maintaining its balance. The dose was then reduced to one tablet three times a day. After four more days, when the dog could walk freely but could not climb stairs, the dosage was again reduced to two tablets daily. On December 6 (2 weeks after the start of the phenylbutazone therapy), the dog was able to climb stairs but with an effort. The regular administration of the drug was

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*By the chemists of J. R. Geigy Co. of Basel, Switzerland.

discontinued except when the animal showed either pain or an effort in getting about.

Case 3.—On Oct. 10, 1953, a 10-year-old, male English Setter developed a lameness localized in the left elbow, possibly the result of an injury while hunting. The lameness was of the recurring type and seemed to be worsened when the dog worked hard or during colder weather, suggesting a diagnosis of arthritis.

Phenylbutazone (200 mg.) was administered by mouth three times daily for three days. The dog hunted soundly on the fourth day. Medication was then reduced to 200 mg. twice daily, when needed. However, for two days before it was planned to hunt the dog, phenylbutazone (200 mg., four times daily) was administered. Under this regimen, the dog has been hunting soundly on each hunting day.

Case 4.—On Nov. 3, 1953, a Terrier-type, 6-year-old, spayed female was reported to have carried the left hind leg for approximately one week after falling down an entire flight of stairs. Examination revealed pain localized in the stifle. Symptoms suggested the diagnosis of a meniscus injury.

A regimen of phenylbutazone (100-mg. tablets three times daily) was started, and in four days the dog began to put weight on the affected limb. The dosage was then reduced to one tablet twice a day for seven more days, at which time the dog walked soundly. Since this type of lameness is expected to recur, a prescription for phenylbutazone was given to the owner for use as needed.

The foregoing case reports are typical examples selected from a series of approximately 30 cases seen during the past year which have responded satisfactorily to phenylbutazone. Toxicity has not been observed. Blood studies were not made during treatment. Dosages were kept to a minimum in order to forestall toxicity such as has been reported in human beings.

DISCUSSION

Knowledge of the metabolism of phenylbutazone is based almost entirely upon the work of Brodie and his associates.[9,10] These investigators reported striking increases in the utilization and excretion rate of the drug in dogs as compared to man. Consequently, initial dosages used throughout this study were approximately of the same magnitude as that recommended for use in man. The dosage was gradually reduced when the desired response was attained in order to avoid the possibility of any toxicity.

SUMMARY

A discussion of the use of phenylbutazone in the treatment of painful conditions of the canine musculoskeletal system is presented. Clinical experience in a variety of such cases suggests that this drug be considered as a valuable addition to the formulary of veterinary medicine.

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Considerations for a Canine Blood Bank

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THE REQUIREMENTS and indications for whole blood transfusions in canine medicine and surgery[1-4] closely parallel those of human practice.[5-8] Little doubt can be expressed about the importance and proper employment of this type of therapy in a modern hospital.[9]

The misgivings with which many practitioners regard the terms "blood transfusion" or "blood bank" are in many instances derived from unfortunate past experiences in administering blood. This attitude is not currently justified and an endeavor shall be made in the following discussion to present a more simplified approach to the procedures involved. A system whereby an adequate supply of blood is available at all times, with a minimum outlay of time and capital, is presented.*

ADVANTAGES OF A BLOOD BANK**

The chief advantage of a blood bank is that blood can be made readily available at all times. The time-consuming procedure of preparing a donor animal and drawing the blood during an emergency is eliminated. Experience has shown that any delay in treatment of hemorrhagic shock adds greatly to the mortality.[10]

A blood bank is the best insurance against shock during elective operations. Prompt transfusions of large volumes of blood in cases of severe hemorrhage or traumatic shock are often necessary and would be extremely difficult without a sufficient quantity of preserved blood. It occasionally has proved practical to give a canine patient 2½ liters of blood during a single operation.[11]

When a bank is maintained, the blood may be collected at the convenience of the practitioner rather than at the unpredictable time of an emergency.

Where banks have been established and transfusions are made readily accessible, the tendency is to use more whole blood. The clinician then learns new indications for this type of therapy. These observations have been adequately confirmed in a number of human hospitals[12] and the same is apparent in veterinary practice.

In the average small animal practice, the maintenance of canine donors as a source of whole blood can be an expensive enterprise. Let us assume that 2,500 cc. of whole blood, which on occasion might be required in a single operation,[11] would meet the average requirements for one week. This would necessitate the maintenance of 6 large dogs (40 to 70 lb.). Aside from the feed and care involved, the space occupied by these animals is often an important factor. If blood therapy is to be employed to its just capacity, additional sources should be investigated.

PROCUREMENT OF BLOOD DONORS

The source of whole blood can be either donors kept indefinitely or healthy animals to be euthanized. Objections to the former have been mentioned, so where at all possible the latter seems to be the choice.

Where an animal is to be euthanized, one may safely anticipate 480 cc. of blood from a 20-lb. dog. In many instances, that amount has been collected from animals weighing even less.

In most communities, arrangements can be made with the municipal pound for an adequate supply of animals at varying intervals. Euthanasia cases presented by the clientele also may offer some sources of blood. After a proper explanation of the purpose and methods of aspiration, few

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The authors express their sincere appreciation to Dr. Paul L. Piercy for his advice on the project and assistance in preparing the manuscript.

*The establishment of a canine blood bank under the joint supervision of the Departments of Clinics and Medicine and Physiology and Pharmacology, School of Veterinary Medicine, University of Georgia, Athens.

**In part, the advantages to be discussed have been acquired from the literature on findings of various human hospitals (DeGowin, Hardin, and Alsever). It has been the experience of the University of Georgia small animal clinic that these also apply to the veterinary hospital, with the additions of several other factors for consideration.

people will object to a "bleeding out" mode of euthanasia. From an economic aspect, the therapeutic value of the blood obtained is far greater than the standard fee for "putting an animal to sleep."

Some discrepancy of opinion seems to exist as to the necessity for cross-matching donor and recipient blood prior to a transfusion. It has recently been reported[9] that this precaution is unwarranted for most dogs; however, substantial evidence has been presented to the contrary.[13] At present, cross-matching is not done in the small animal clinic at the University of Georgia and apparently no immediate difficulties have been encountered.

Past reports have indicated a necessity for an examination of blood for microfilariae preceding transfusion. Considering the life cycle of *Dirofilaria immitis*,[14,15] this is obviously unnecessary. A much more important factor to be considered is that the donor animal be free from any type of bacterial infection. This can usually be determined by the general appearance of the prospective donor and should not present any problem. If the temperature is normal and the actions are those of a "well animal," it is usually safe to assume that the blood will be satisfactory for transfusions.

Categories of Whole Blood

Before considering the procurement technique, it is perhaps in order to differentiate between fresh, stored, and preserved blood.[16]

Fresh blood must be administered to the patient within a few hours after collection. Storage between 5 to 10 C. during the collection-administration interval is important if administration is delayed for any reason. The use of unrefrigerated blood, except for an immediate transfusion, should be avoided.

Stored blood is that which has been collected in sodium citrate only and kept at a suitable temperature (5 to 10 C.). Although adequate refrigeration is observed when blood is collected and stored in this manner, its use is not recommended after the fifth day following aspiration.

Preserved blood is that collected with a sodium citrate solution to which dextrose is added. With it, hemolytic tendencies are minimized. Although some changes do occur, these are not as rapid as those that would occur without the dextrose preservative, and the keeping qualities of the blood are greatly increased. Preserved blood is clinically effective for a much longer time than stored blood.

For a canine blood bank, the advantages of preserved blood are apparent. All blood collected by the University clinic is obtained in an anticoagulant dextrose (ACD) solution. While the term ACD does not refer to any particular formula, the basic ingredients are dextrose, sodium citrate, and citric acid. The sterile ACD solution is purchased in the vacuum bottle employed in the aspiration of the blood.

There is some difference of opinion as to the length of time preserved canine blood may be held in storage.[3,9] Twenty-one days is generally considered the upper limit[17] in human practice; however, there are reports in the literature that blood may be preserved as long as thirty days.[16] After blood has been preserved, the criterion as to its usefulness is based on the survival of the erythrocytes in the circulation of the recipient. The degree of hemolysis governs this factor and may be clearly determined by inspection of the color changes in the plasma when the cellular elements are allowed to settle.[3] In view of the fact that the canine erythrocyte exhibits approximately the same resistance to hemolysis as does the human erythrocyte,[18] it would appear that there would be little variance in the keeping qualities of the blood. Blood has been satisfactorily preserved in the clinic for twenty-one days; however, there have been instances where hemolysis was observed at fourteen days. Individual resistance to hemolysis no doubt plays an important role in the length of time the tissue may be preserved.

Materials and Methods for Procurement and Administration

In the field of human medicine, the evacuated bottle is the source of negative pressure for the aspiration of blood. The adaptation of this equipment to canine practice is a simple procedure and has many advantages.[9] Disposable collecting and dispensing sets,* which have been extensively employed by the clinic, have been found to be unexcelled in simplicity, sterility, and economy.

Procurement.—For collecting blood to be preserved, it is preferable to have the donor in a stage of light anesthesia. Pentobarbital sodium has been the choice of anesthetics in preparing a

*The ACD vacuum bottles, with disposable collecting and dispensing sets, are made available by a number of reputable manufacturers.

dog from which blood is to be drawn by intracardial puncture. Although little pain is produced when this method is properly employed, immobility is nevertheless highly desirable.

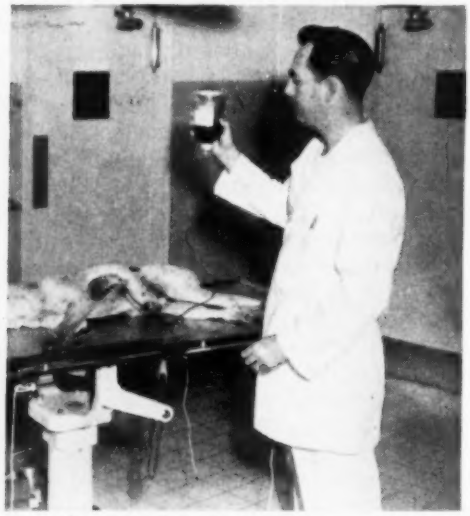

Fig. 1—The collection of blood from an anesthetized dog.

When the desired depth of anesthesia has been produced, the left side, in the region of the heart, is prepared in the same manner as for surgery. Asepsis can not be overemphasized, especially where the blood is to be preserved for any length of time. The collecting (donor) equipment is then attached to the evacuated bottle. A donor set carrying a 16-gauge needle is preferred for intracardial aspiration. Care must be taken to insure the maintenance of the vacuum prior to the intracardial puncture.

It is mandatory that the flask and ACD solution be chilled before collecting blood. This results in a more rapid and uniform cooling of the erythrocytes, thus reducing hemolytic tendencies.[3]

The apex of the heart is located by palpation, and the point of greatest intensity of beat is the site for entrance. Prior to the insertion of the donor needle, a small incision is made in the skin to eliminate the possibility of an occluding "phig" being cut as the needle is inserted. Best results are obtained when the bevel of the needle is inserted facing the bicuspid valve. The needle is inserted with a sudden thrust. When entrance into the left ventricle has been established, the force of the systolic pressure will drive the blood from 2 to 5 cc. into the collecting tube. The vacuum is then released and the blood is allowed to enter the container which should be inverted to obtain an adequate mixing with the ACD solution. Some degree of manipulation may be necessary to acquire the maximum flow of blood. When the capacity of the anticoagulant is reached, the collecting tube is again closed and the assembly broken at the flask and heart, respectively.

Administration.—Whole blood should be thoroughly mixed before being administered. For transfusion purposes, it is taken directly from the refrigerator and administered without warming.[17] Chilled blood has been used routinely in the clinic, with no ill effects having been observed.

When the desired quantity of blood has been given, the remaining contents of a flask may be restored at the prescribed temperature with the administration set. It is highly advisable, however, that once the contamination-proof seal is broken, the contents of a bottle be used promptly.

COMMENT

The need for whole blood therapy in canine practice is undisputed. The means by which such treatment is made possible has been described. It is believed that the practicing veterinarian will experience equally as gratifying results from similar establishment of a canine blood bank.

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Fatal Aortic Spirocercosis in a Dog

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Spirocercosis is a common disease in Philippine dogs. Since fatalities due to the nematode *Spirocerca lupi* are not frequent, it is felt that a report of this unusual case would be of interest. Observations were made at the College of Veterinary Medicine, University of the Philippines.

A male, black-and-tan German Shepherd dog apparently in good health on Nov. 1, 1952, was found dead the following morning. The animal was 3 years old and weighed 60 lb. An autopsy was performed immediately. Most of the affected tissue was preserved in formalin, but representative portions were sectioned at 10 μ and stained with Heidenhain's hematoxylin and eosin.

The sudden death was obviously due to extensive hemorrhage as the result of a ruptured aorta. The pleural cavity was filled with blood clots of varying sizes, the largest being about the diameter of a human fist. The heart and peritoneum were unusually pale. Examination of the aorta revealed tumor-like growths in the form of small nodules clustered along its longitudinal axis. These growths extended from the heart, along the artery, to the diaphragm. They were so numerous and close together that they formed one big solid mass. Numerous *Spirocerca lupi* could be seen protruding from their cysts within this mass. Many more worms were found coiled in characteristic manner within the walls of the aorta. The affected part of this vessel was extremely thickened by fibrosis along the dorsal area, being in some spots as thick as 1 inch. The ventral surface, however, was thin. There was a longitudinal rupture of this thin region of the aorta. The normal appearance of the vessel was entirely lost.

—*Topacio and Noble*

Fig. 1—Section through a cyst of the aorta showing 2 Spirocerca lupi. One was coiled back upon itself, so that it was cut through twice. The drawing was made with the aid of a camera lucida. x 100.

It was whitish in some areas and dark red in others. Cutting with a knife showed it to be hard and elastic.

Microscopic examination revealed extensive necrosis and calcification. The histological appearance of this part of the aorta had become completely abnormal. Fibrotic tissue had almost replaced the three coats of the vessel although, in some spots, nuclei of the muscle cells could be observed. A marked leukocytic infiltration had occurred in some regions but was moderate to absent in others. Areas immediately surrounding the parasites were entirely fibrotic. Figure 1 shows a section through 2 of the worms within a cyst. Due to coiling, 1 worm has been cut through twice. The surrounding masses consist mainly of fibrotic tissue. The dark bodies are leukocytes and nuclei of muscle cells.

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Distemper Immunization of Mink by Air-Borne Infection with Egg-Adapted Virus

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IT HAS BEEN shown in our laboratory that immunity can be induced in ferrets by exposing them to living, nebulized, egg-adapted distemper virus.[1] This paper describes methods and procedures by which mink were immunized, using this principle.

MATERIALS AND METHODS

Animals.—Stock mink from the herd of the Pullman Fur Animal Disease Research Laboratory were used for the experimental work in experiment 1 of this investigation. The animals were raised in semi-isolation and were in good physical condition. They were maintained on a ration consisting of horsemeat and fish (80%) and commercial cereals (20%). Both males and females were used. Some of the dams of the young mink used in this trial had been vaccinated against distemper three years prior to the present experiment. The mink employed in experiment 2 were part of a commercial mink herd at Usk, Wash. The dams of the test mink in this herd had had no known previous experience with the virus.

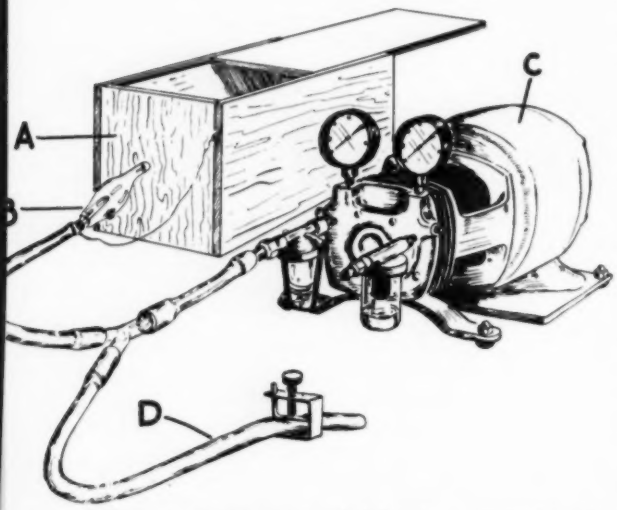

Fig. 1—Arrangement of laboratory apparatus: A-cloud chamber; B-nebulizer; C-pressure pump; D-bleeder tube for adjusting pressure.

Air-Borne Inoculum.—Haig's Onderstepoort strain of egg-adapted distemper virus from the ninetieth passage level was used as the inoculum in experiment 1. This virus has been described in previous papers.[2,3] Seed virus, 0.1 ml., was inoculated on the chorioallantoic membrane of 7-day-old chicken embryos. After further incubation for six days, the infected membranes were removed and ground in a Waring Blendor with sufficient nutrient broth (Difco) containing 10 per cent horse serum as a diluent to make a 10^{-1} suspension of infected membranes. Each milliliter of diluent contained 500 units of crystalline penicillin G and 500 μg. of dihydrostreptomycin sulfate. This material was distributed into sterile ampules and stored at -20 C. until used. The air-borne inoculum was standardized by a titration consisting of serial fivefold dilutions of virus. The 50 per cent infective dose ($i.d._{50}$) per 0.1 ml. of this inoculum in chicken embryos was $10^{3.4}$.

In experiment 2, the membranes were treated in the same manner with the exception that the eighty-fifth passage of the Onderstepoort strain was used and the diluent in this instance contained 5 per cent glycerin and 5 per cent horse serum with the same concentration of antibiotics added. An Eppenbach QV-6 colloid mill was used for grinding the membranes which were processed for eight minutes. The mill was initially set at 70 with the final setting at 25. The material was stored as a 10^{-1} dilution at -20 C. and thawed just prior to use. The $i.d._{50}$/0.1 ml. of air-borne inoculum in chicken embryos was $10^{4.4}$.

Technique of Air-Borne Inoculation.—The general arrangement of the apparatus used in experiment 1 is illustrated in figure 1. The cloud chamber was a wooden box which measured 9 by 6 by 6 in. The aërosol was produced by a DeVilbiss 40 type nebulizer operated by a Cenco vacuum pressure pump at 3 lb. of air pressure. The nebulizer was fitted into a porthole in one side of the chamber. Young, distemper-susceptible mink were confined to the chamber for three minutes, and the nebulizer was in operation for the first two minutes of this period. During each minute of operation, approximately 0.3 ml. of inoculum was nebulized into the chamber. During

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Scientific Paper No. 1291, Washington Agricultural Experiment Station, Pullman.

Before these studies were completed, J. A. Crawley, of the University of Toronto, provided data which indicate that mink can be immunized against distemper by using the same principle as the one recorded in this paper.

The authors express their appreciation to Mr. Keith Pennell for allowing them to conduct experiment 2 of this study on his mink ranch.

the exposure, the temperature of the room was 71 F. and the relative humidity was 43 per cent.

In experiment 2, each mink was confined to its nest box. The nest boxes had woven wire tops so that it was necessary to place a piece of canvas over them before administering the vaccine. In this trial, the air-borne inoculum was produced by a Z & W Machine Products insect sprayer (1-pint size). The sprayer was attached to a 500-cc., screw-top bottle which served as a reservoir for the vaccine. A corner of the canvas was lifted and the nozzle of the sprayer was directed toward the center of the nest box. Each nest box received the spray produced by one depression of the plunger which used approximately 1 ml. of inoculum. The canvas was left on each nest box for approximately one minute.

Challenge Virus.—Canine distemper vaccine (distemperoid-serial 174-A) was employed. Stock quantities of a spleen suspension were prepared as follows: The contents of 1 ampule was injected intramuscularly into 2 ferrets which became moribund on the eleventh day following inoculation. They were killed and their spleens were removed, weighed, and ground. A 20 per cent w/v suspension in nutrient broth was prepared.

Neutralization Tests.—Egg-neutralization tests, as previously reported,[4] were employed to estimate changes in the antibody level of the mink in experiment 2 occurring as a result of modified virus exposure. The neutralization tests utilized a constant amount of virus in serial fivefold dilutions of serums; 500 units of virus were employed in the tests. The mixtures of virus and serum were incubated at 5 C. for twenty-four hours and then inoculated. The presence of lesions on the chorioallantoic membrane constituted the end point of the titration. The above procedure was modified, however, in that the eggs were inoculated in the manner described by Brandly,[5] in which a triangle is cut in the shell over the air sac, and the test material inoculated beneath the inner shell membrane onto the chorioallantoic membrane. This method is more rapid and accurate since nonspecific reactions caused by dropping the membranes are eliminated, and the lesions are confined to a smaller area on the membrane. It has been found that lesions can be more easily detected by spreading the membrane on a Petri dish and placing it on a dark-field Quebec colony counter.

RESULTS

Experiment 1.—Thirty-three young mink were exposed to the aërosol inoculum on Aug. 9, 1953. The animals in this group showed no clinical reaction to the exposure. Thirty-two days later (Sept. 10), each mink was given, by the intramuscular route, 1 ml. of the challenge virus. On the same date, 25 unvaccinated mink were each given 1 ml. of the virulent virus. None of the mink which had received the aërosol exposure of modified virus developed signs of distemper, whereas 18 of the control mink showed signs of infection and, of these, 10 died of the disease.

Experiment 2.—On Oct. 28, 1953, 226 young mink on a commercial ranch were exposed by the inhalation route, using the insect sprayer. Because of the danger of killing animals while bleeding, preëxposure serum samples were not secured from the animals in this group. Since they could not be challenged with virus, at pelting time (41 days later) 25 mink from this group were selected at random and bled by cardiac puncture for neutralizing antibody tests. From an adjoining shed in which mink were not sprayed, 14 young mink were picked at random to serve as controls.

Neutralizing antibodies were detected in 22 of the 25 serum samples taken from the sprayed group. The fiducial interval was calculated and was found to be 75 to 100 per cent ($P < 0.05$), *viz.*, these data indicate that the true proportion of mink developing neutralizing antibodies as a result of this spraying method is somewhere in the interval above 75 per cent. If the 50 per cent serum-neutralizing dose ($n.d._{50}$) is expressed as the reciprocal of the $n.d._{50}$ dilution, the minimum titer was 130 and the maximum titer was 7,900. The geometric mean titer was 2,400. None of the 14 samples secured from the nonexposed group showed neutralizing properties as determined by the neutralization test.

DISCUSSION

The distemper virus is spread in nature primarily through the air. It is, therefore, logical to assume that a modified living virus transmitted by an artificially created aërosol might evoke an antibody response. There is no information regarding strain differences, infective particle size, virus concentration, or the effects of temperature, humidity, sunlight, and air currents on modified or field strains of the virus in natural or experimental situations. Similarly, the vagaries of host response must be considered. A comprehensive and critical study of the host-parasite relationship is needed before this method of immunization can be employed under the wide divergencies of field conditions.

The quantities of modified virus administered to the mink in this study were arbitrarily set in an effort to attain infection.

Quantitative studies of air-borne infection are lacking. In experiment 2, glycerol was included in the suspending medium to stabilize the particle size of the aërosol.

If this procedure can be adapted for mass vaccination on mink ranches, it will have some advantages over the parenteral administration of living or inactivated virus vaccines. Since the air-borne inoculation does not require the handling of mink, it could decrease the opportunity of spread of virulent virus at the time of vaccination. Gorham and Brandly[6] have demonstrated the presence of the distemper virus on mink-handling mitts twenty minutes following the restraint of infected mink.

The opportune time for prophylactic vaccination would be early each summer when the kits are still with the dam. At this time, one administration of air-borne inoculum might be expected to immunize the dam and her kits.

The equipment for nebulization must be perfected. The insect sprayer used in experiment 2 was wasteful of virus in that many large particles were ejected. Since aërosol particles tend to settle vertically at a rate related to their size, the rapid settling with the resultant poor dispersion probably decreased the efficacy of the system. If a proper relation between time of exposure and particle size can be obtained, it is believed that a larger percentage of the exposed mink may become immunized.

On the basis of available evidence, it appears that the onset of resistance in ferrets occurs more rapidly when the egg-adapted strain is given parenterally than following air-borne inoculation.[1] Ferrets exposed to egg-adapted distemper vaccine as an aërosol became immune at five days; however, in previous work,[7] it was demonstrated that ferrets which received the same strain of virus intramuscularly two or more days before challenge did not show signs of distemper. There may also be a difference in the duration of immunity following parenteral and air-borne exposures.

It is important to know the influence that the age of the vaccinated animal and the immunity status of the dam has on the immunizability of the young animals. Experiments are in progress to demonstrate the age at which ferrets and mink, from immune and susceptible dams, can be protected against challenge with virulent virus by vaccination.

SUMMARY

1) Following an aërosol exposure of living egg-adapted distemper virus, 33 mink became resistant to virulent distemper virus.

2) When the modified virus was administered as a spray to 226 mink, at least 75 per cent of them developed distemper virus neutralizing antibodies.

3) Before this method of immunization can be used on commercial ranches, a careful and inclusive investigation of the host-parasite relationship of the distemper virus is necessary.

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Antibiotics and *Candida Albicans*

Why does *Candida albicans* infection so often follow antibiotic therapy? In quest of the answer, several antibiotics were tested on broth cultures of this fungus. Three lots of chlortetracycline (aureomycin) stimulated the growth of *C. albicans* but penicillin, chloromycetin,® streptomycin, and terramycin® apparently did not. The possibilities are: (1) The suppression of bacteria improves the fungus' food supply; (2) the antibiotics lower the resistance of the mucous membrane by disturbing its nutrition; and (3) the antibiotics somehow directly stimulate the growth of the fungus. —*Vet. Bull., April, 1954.*

Variations (Variants) of Hog Cholera Virus. II. Perpetuation and Attempts at Enhancement of Variant Characteristics of Hog Cholera Virus by Means of Serial Passage with Antiserum and Without Antiserum

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IN 1951, Dale *et al.*[1] reported the identification of hog cholera viruses with antigenic and immunological characteristics which differed from other known hog cholera viruses previously studied. Viruses with these serological characteristics were designated as variants of hog cholera viruses, or "variant viruses." These viruses were incriminated in the losses in farm herds in 1949 and 1950 when they were used in conjunction with certain hyperimmune serums in the simultaneous serum-virus treatment for immunization against hog cholera.

Other than limited antigenic and immunological differences, the variant viruses studied so far are typical hog cholera viruses in their action. This is indicated by the fact that swine immune to regular hog cholera virus by simultaneous vaccination using regular virus are also immune to the variant viruses. Variant viruses are not immunologically distinct types as seen in the classical foot-and-mouth disease immunological types A, O, and C, and the eastern and western types of equine encephalomyelitis virus, but are variants within a type.

The identification of a variant virus was based partly on the observations that when 2 cc. of variant virus was injected into pigs simultaneously with a normally protective dose of a certain hog cholera antiserum, typical hog cholera was produced although pigs injected with the same dose of this serum and 2 cc. of regular virus were fully protected. It was also observed that cholera-immune pigs remained well when challenged with 2 cc. of variant virus, but when 2 cc. of the virus was injected into susceptible pigs, typical hog cholera was produced. Significant was the fact that a variant virus, which produced hog cholera with a dose of 1.0 cc. but not with a dose of 0.008 cc., failed to be counteracted by 15.0 cc. of a given serum while a regular virus, which produced hog cholera with a dose of 0.000001 cc., was counteracted by 5.0 cc. of the same serum. Thus, a given amount of variant virus contained at least one hundred times less infective doses than the same amount of the regular virus, yet more serum was required to counteract it than to counteract regular virus.

These workers also observed that after seven serial passages of the variant virus simultaneously with serum, and seven parallel serial passages without serum, the variant characteristics were still demonstrable in the former case while in the latter case they were not.

From the commencement of this work, it was apparent that if any extended research was to be conducted it would be necessary to perpetuate the variant characteristics of these viruses qualitatively undiminuted. This is a report on the methods of perpetuation of the variant characteristics of hog cholera virus by means of its serial passages through susceptible pigs simultaneously with serum and without serum, and also the limitations of these methods.

MATERIALS

BAI Experimental Serum No. 1.—On the basis of exhaustive tests, this serum was selected to detect variant virus. In the tests, varying doses of BAI experimental serum (BAIES) No. 1 were used simultaneously with 2-cc. doses of regular and of variant virus. When a dose of 15 cc. of this serum was used with 2 cc. of regular virus, usually all the pigs were adequately protected, whereas when the same dose of this serum was used with 2 cc. of this variant virus, only occasionally were pigs adequately protected. In other tests, it was found that more marked variant characteristics were exhibited by the virus in the blood from a pig injected with 15 cc. of serum and 2 cc. of variant virus than when the pig was injected with doses of more than 15 cc. of serum and 2 cc. of the virus. In other words, it seemed that 28 cc. or more of serum

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The authors express their appreciation to J. P. Torrey, M.S., D.V.M., and W. C. Amtower, B.S., for assistance in carrying out some of the work reported.

inhibited the growth of variant virus more than the 15-cc. dose and, even though variant characteristics were still present, they were not as marked as when the lower dose of serum was used. On the basis of these tests and the fact that this is the amount of serum used in the test of commercially prepared serums, a dose of 15 cc. of serum was selected as a test dose. If the unknown virus to be tested had variant characteristics, pigs injected with 2 cc. of it simultaneously with 15 cc. of BAI experimental serum No. 1 would not be adequately protected, whereas the contrary would be true if the test material were regular virus.

Virus A.—This virus is one of the commercial hog cholera viruses described by Dale *et al.*[1] It was associated with the postvaccination losses in farm herds in 1949. The minimum dose that produced cholera (m.l.d.) in 1 or both of 2 pigs was not less than 0.008 cc. It was a proved variant virus.

Other Serums and Viruses.—Other serums and viruses used will be described later in this paper.

The Pigs.—Pigs used in this work were acquired, for the most part, from the herd of the BAI Division of Animal Husbandry at Beltsville, or were raised at the Animal Disease Station at Beltsville where most of this experimental work was done. Other pigs were purchased in Iowa and transported to the Hog Cholera Research Station at Ames, where the remainder of this work was done. The history of all the pigs, with respect to immunization against hog cholera, was known and, in some cases, a few pigs from each accession were challenged with 2 cc. of regular hog cholera virus to demonstrate susceptibility. Each of the pigs used for the first seven passages was 1 of several animals used in an experiment testing viruses for variant characteristics.

METHODS AND RESULTS

The pigs used for the passages of virus were bled on the sixth or seventh day by venipuncture of the anterior vena cava, using the method described by Carle and Dewhirst.[2] Aseptic technique was used and the blood was received in a sterile vacuum flask containing glass beads and copper wire for defibrination. As the blood entered the flask, the defibrination was accomplished by agitating the flask vigorously.

The dosages of virus and serum used for each passage are indicated below. A hemoculture was performed for each blood specimen, necropsies were performed, and bacteriological cultures were made of the heart blood, spleen, kidney, liver, and lung of all pigs which died, were killed when moribund, or exsanguinated.

Titrations were performed according to the methods and protocols described by Cole, Henley, and Hubbard.[3]

As described by Dale *et al.*,[1] seven serial passages of virus A without serum were made through susceptible pigs, after which the variant characteristics were not demonstrable when administered simultaneously with 15 cc. of serum. Similarly tested, the fourth-passage blood in this series indicated that the variant characteristics of a virus were still present. However, a test of the fifth-passage blood suggested that a significant diminution had taken place.

In order to inhibit the growth of the

TABLE I—First to Ninth Serial Passage of Virus A[1] with Serum

Passage	Pig (No.)	Weight (lb.)	Virus (2 cc.)	Serum			Days of impaired appetite when bled	Days of febricity (104 F.) when bled	Day bled	Clinical
				Dose						
				Kind	cc.	cc./lb.				
First	8049	80 est.	A	C[1][2]	30	0.38	0	4	6th	EFV[3] 6th day
Second	8001	110 est.	8049	C1	40	0.27	0	3	6th	EFV on 6th day
Third	8018	80 est.	8001	C1	30	0.38	0	2	6th	D[3] on 15th day
Fourth	8183	43	8018	C1	28	0.65	0	4	7th	Sv[3], Surv[3] & R[3] on 23rd day
Fifth	8171	54	8183	C1	15	0.28	0	4	7th	D on 11th day
Sixth	8140	42	8171	C2	15	0.36	4	3	7th	D on 11th day
Seventh	8246	82	8140	C2	15	0.18	4	5	7th	EFV on 7th day
Eighth	5 pigs (V.V.[3] s.n.1)	45.7 ave.	8246	C2	15	0.33	0-3	4-6	7th	EFV on 7th day
Ninth	6 pigs (V.V.s.n.2)	73 ave.	V.V.s.n.1	C2	15	0.20	0-3	3-5	7th	EFV on 7th day

Necropsy—All pigs except pig 8183 had lesions commonly associated with hog cholera; it survived and so necropsy was not performed.

Bacteriology—All pigs were negative on hemoculture. All except pigs 8183 and 8140 were negative on tissue culture. Pig 8140 had Escherichia coli in the liver. Pig 8183 survived and so no tissue culture was made.

[1]For description of this virus see text. [2]Commercially prepared serums are designated by the letter "C." [3]EFV = exsanguinated for virus; D = died or killed when moribund; Sv = severe reaction; Surv & R = survived and released; V.V. = variant virus.

TABLE 1A—Results of Test for Variant Characteristics of Variant Virus s.n. 2, Which Represents the Ninth Direct Passage of Virus A[1] with Serum

No. pigs	BAIES[2] No. 1	V.V.[2] s.n. 2	No. of pigs giving various reactions				Pigs adequately protected[3] (%)
			N[2]	Sl[2]	Sv[2]	D[2]	
2	5 cc.	2 cc.	0	0	0	2	0
2	15 cc.	2 cc.	0	0	0	2	0
2	30 cc.	2 cc.	0	1	0	1	50
2	45 cc.	2 cc.	0	2	0	0	100

All pigs which died had lesions commonly associated with hog cholera and were negative on tissue culture.

[1]See text for description of this virus. [2]BAIES = BAI experimental serum; V.V. = variant virus; s.n. = serial number; N = normal (no impairment of appetite); Sl = slight reaction; Sv = severe reaction; D = died or killed when moribund. [3]Pigs were considered adequately protected if they did not have more than a slight reaction.

TABLE 2—First to Seventh Serial Passage of Variant Virus s.n. 2[1] Without Serum

Passage	Pig (No.)	Virus (2 cc.)	Days impaired appetite when bled	Days of febricity (104 F.) when bled	Day bled	Clinical
First	8816	V.V.[2] s.n.2	3	6	7th	D,[2] 14th day
Second	8814	8816	4	6	6th	EFV,[2] 6th day
Third	9095	8814	4	4	6th	EFV, 6th day
Fourth	9099	9095	3	5	6th	EFV, 6th day
Fifth	9105	9099	3	4	6th	EFV, 6th day
Sixth	9107	9105	4	2	6th	EFV, 6th day
Seventh	9096	9107	6	4	7th	EFV, 7th day

All pigs had lesions commonly associated with hog cholera and were negative on tissue culture and hemoculture.

[1]See tables 1 and 1A for description and derivation of this virus. [2]V.V. = variant virus; D = died or killed when moribund; EFV = exsanguinated for virus.

regular virus and allow the variant virus to multiply, seven serial passages of virus A, simultaneously with various commercial serums, were made through susceptible pigs; every passage was equivalent to a test for variant characteristics. An eighth passage was made by injecting each of 6 pigs with 2 cc. of blood from the seventh passage and 15 cc. of serum. After hemocultures were made, the blood from each pig was rapidly frozen and stored in a dry-ice chest until used. *Salmonella choleraesuis* was present in one of these blood specimens, so it was discarded. After thawing at room temperature, the other five blood specimens were pooled and the resultant virus was identified as variant virus s.n. 1. A ninth passage was made by injecting each of 8 pigs with 2 cc. of variant virus s.n. 1 and 15 cc. of serum. One of these pigs died before blood could be drawn. Hemocultures of blood specimens from the others, prior to freezing, revealed the presence of *S. choleraesuis* in one, so it was discarded. After thawing at room temperature, the other six specimens were pooled and identified as variant virus s.n. 2. The details of the nine passages of virus A simultaneously with serum are given in table 1 and the details of the test for variant characteristics of variant virus s.n. 2 are given in table 1A.

VARIOUS TESTS MADE

Test for Retention of Variant Characteristics of Virus A After Seven Serial Passages Without Serum Following Nine Passages with Serum.—In order to determine whether the marked variant characteristics of variant virus s.n. 2 represented a true enhancement of the variant characteristics of virus A of which it was the direct derivative, variant virus s.n. 2 was passed serially seven times without serum. In table 2 are shown the details of these passages and in table 2A are shown the results of the test for variant characteristics of the

TABLE 2A—Results of Test for Variant Characteristics of Variant Virus 9096[1]

No. of pigs	Ave. est. wt. (lb.)	BAIES[2] No. 1 (Dose)		V.V.[2] 9096	Regular[3] BAI virus 286	No. of pigs giving various reactions				Pigs adequately protected[5] (%)
		cc.	cc./lb.			N[2]	Sl[2]	Sv[2]	D[2]	
2	75	15	0.20	2 cc.	.....	0	0	0	2[4]	0
2	95	15	0.16	.....	2 cc.	2	0	0	0	100
1	....	0	.....	2 cc.	.....	0	0	0	1	0
1	....	0	.....	.....	2 cc.	0	0	0	1	0

All pigs which died had lesions commonly associated with hog cholera and were negative on tissue culture.

[1]This is the seventh serial passage without serum following nine serial passages simultaneously with serum of virus A. One of 2 pigs injected with 0.00005 cc. and 1 of 2 pigs injected with 0.000001 cc. survived. For details of the derivation of variant virus 9096, see text and table 2. For description of virus A see text.

[2]BAIES = BAI experimental serum; V.V. = variant virus; N = normal (no impairment of appetite); Sl = slight reaction; Sv = severe reaction; D = died or killed when moribund.

[3]Regular, unphenolized virus. It had been stored in a freezer at −40 C. or below for 591 days. Its minimum lethal dose was 0.000005 cc. when prepared and 0.000001 cc. 331 days after preparation. [4]Both of these pigs had symptoms usually associated with hog cholera. They were exsanguinated for virus on the fourth and seventh days after injection. [5]Pigs were considered adequately protected if they did not have more than a slight reaction.

Table 3—Eighth to Fourteenth Serial Passage of Variant Virus s.n. 2[1] Without Serum

Passage	Pig (No.)	Virus Kind	Virus Dose	Days of impaired appetite when bled	Days of febricity (104 F.) when bled	Day bled	Clinical
Eighth	4437[2]	9096[3]	2 cc.	4	4	6th	EFV[4] on 6th day
Ninth	4438	4437	2 cc.	3	3	6th	EFV on 6th day
Tenth	4447	4438	2 cc.	4	2	6th	EFV on 6th day
Eleventh	4448	4447	2 cc.	2	2	6th	D[4] on 21st day
Twelfth	4503	4448	10 cc.[5]	4	4	8th	D on 21st day
Thirteenth	4521	4503	10 cc.	5	4	7th	D on 13th day
Fourteenth	4552	4521	10 cc.	5	1	7th	EFV on 7th day

All pigs which died had lesions commonly associated with hog cholera and tissue culture and hemoculture were negative except as noted below. No common bacterial pathogens for swine were isolated.

[1]For description and derivation of this virus, see text and tables 1 and 1A. [2]The change in serial numeration of the pigs was due to the fact that this part of the work was done at the Bureau's Hog Cholera Research Station at Ames, Iowa, whereas the previous work was done at the Bureau's Animal Disease Station at Beltsville, Md. [3]For description and derivation of this virus, see text and tables 2 and 2A. [4]EFV = exsanguinated for virus; D = died or killed when moribund.

[5]The dose of virus was increased to 10 cc. because pig 4448 had exhibited only two days of impairment of appetite and two days of febricity when bled on the sixth day after injection. Therefore, it was felt that by increasing the dose of virus a more marked reaction would be produced.

virus derived after these seven passages, which was identified as variant virus 9096.

The variant characteristics of variant virus 9096, as shown in table 2A, indicated a significant retention of the variant characteristics of virus A. This result is in contrast to the seeming decrease of variant characteristics of the fifth direct passage of virus A without serum when similarly tested.[4] Also, when similarly tested, no variant characteristics of virus A were demonstrated after seven direct passages without serum.[1] Thus, the results showed that the seventh serial passage of virus A without serum, following nine serial passages with serum, still retained variant characteristics.

Test for Retention of Variant Characteristics of Virus A After Fourteen Serial Passages Without Serum Following Nine Passages with Serum.—Since the results of the test in table 2A had shown that virus A would retain variant characteristics for seven passages after it had been passed nine times with serum, it seemed desirable to determine what effect continued passage would have on the virus. Consequently, seven more passages were made without serum and the resultant fourteenth passage, which was identified as virus 4552, was tested for variant characteristics. The details of these passages and the test for variant characteristics are given in tables 3 and 3A.

TABLE 3A—Results of Test for Variant Characteristics of Virus 4552[1]

No. of pigs	Ave. est. wt. (lb.)	BAIES,[2] No. 1 (Dose) cc.	cc./lb.	Virus 4552	No. pigs giving various reactions N[2]	Sl[2]	Sv[2]	D[2]	Pigs adequately protected[3] (%)
2	82.5	5	0.06	2 cc.	0	0	0	2	0
2	80.0	15	0.19	2 cc.	0	1	1	0	50
2	100.0	30	0.30	2 cc.	2	0	0	0	100

All pigs had lesions commonly associated with hog cholera. Escherichia coli was isolated from the liver of 1 of the 2 pigs that died. Small, gram-negative rods were isolated from other tissues. Tissue culture from the other pig was negative.

[1]This is the fourteenth serial passage without serum following nine serial passages simultaneously with serum of virus A. The minimum lethal dose of virus 4552 was at least 0.000001 cc. This was the smallest dose used. For details of the derivation of virus 4552 see text and table 3. For description of virus A see text.

[2]BAIES = BAI experimental serum; N = Normal (no impairment of appetite); Sl = slight reaction; Sv = severe reaction; D = died or killed when moribund. [3]Pigs were considered adequately protected if they did not have more than a slight reaction.

The test for variant characteristics of virus 4552, as shown in table 3A, indicated that it possessed variant characteristics. However, since only 1 of the 2 pigs treated with 15 cc. of serum was inadequately protected, having a severe reaction but recovering later, and neither of the 2 treated with 30 cc. of serum was adversely affected, it seemed possible that there might be a difference in the variant characteristics of virus 4552 from those of virus 9096.

Test for Variant Characteristics of Virus A After Seven Serial Passages with Serum of the Fourteenth Serial Passage Without Serum Following Nine Passages with Serum.—The test for variant characteristics did not indicate the degree of differences, if any, between viruses 4552 and 9096. A test was made to determine the effect of seven serial passages of virus 4552 with serum. The details of these passages and the test for variant characteristics of the final passage, which was identified as virus 5086, are given in tables 4 and 4A, respectively. Other treatments as indicated in the tables were included for comparative purposes.

The results of this test (table 4A) show that 2 pigs, each injected with 2 cc. of virus 5086 and 15 cc. of BAI experimental serum No. 1, and 1 of 2 pigs injected with 2 cc. of virus 9096 and 15 cc. of the same serum, were adequately protected. These results are in contrast to results in previous tests in which pigs injected with 2 cc. of virus 9096 and 15 cc. of BAI experimental serum No. 1 consistently died. In other tests, many pigs injected simultaneously with 30 cc. and 45 cc. of the same serum and this virus were also inadequately protected. These results with virus 5086 were similar to those obtained with virus 4552 as shown in table 3A.

An interval of 602 days had elapsed between the time virus 9096 was first prepared and when it was used in this test (table 4A). During the first 190 days of this period, it was stored in a dry-ice chest at about −70 C. and, during the remainder of the period (412 days), it was stored at −40 C. Virus 4552, which was a derivative of virus 9096, as shown in table 3, was stored for twenty-six days after preparation when tested as shown in table 3A.

Test to Determine the Effects of Age and Freezing Temperatures During Storage on Variant Characteristics of Hog Cholera Virus.—For experimental purposes, it was occasionally desirable to use viruses that had been stored for long periods and at different temperatures. It was therefore decided to test the effects of age and storage temperature on the variant characteristics of variant virus. In the test, virus H and virus 8652 were used as variants; virus 304 was used as a regular virus.

Virus H was a commercial virus that had been used in numerous herds where postvaccination reactions and losses had occurred in 1950. It was tested for variant characteristics, when received, by injecting it simultaneously with doses of 5 cc., 15 cc., 30 cc., and 45 cc. of BAI experimental serum No. 1 into pairs of pigs. All the pigs except the 2 treated with 45 cc. developed symptoms of hog cholera and died in less than twenty-one days. At about the same time, three other tests of this virus were made at different places and with pigs of different weights and from different sources. The results of these four tests were described in a previous publication.[1] Virus H had been stored in a dry-ice chest at about −70 C. for 1,197 days when it was used in this test.

Virus 8652 was the first passage of virus H simultaneously with 15 cc. of BAI experimental serum No. 1. Pig 8652, from which this virus was obtained, developed symptoms of hog cholera following the injection of 2 cc. of virus H and 15 cc. of BAI experimental serum No. 1. It was bled for virus determination on the seventh day and was allowed to live. It died on the twelfth day after injection and at necropsy had lesions commonly associated with hog cholera. This virus was stored at −70 C. for 439 days and then at −40 C. for 740 days and was 1,179 days old when used in the present test.

BAI virus 304 was a regular virus and was in constant use in experimental work at the Hog Cholera Research Station at Ames, Iowa. It was derived, as the eighth passage, from virus 286 which was described previously.[1] It was produced from the blood of 5 cholera-susceptible pigs. Its minimum lethal dose was 0.00001 cc. It was phenolized and stored in an electric deep-freeze chest at −40 C. It was 134 days old when used in this test.

The details and results of this test are given in table 5.

The results of the test show that variant characteristics of virus H and virus 8652 are retained after storage at −40 C. to −70 C. for 1,190 and 1,179 days, respectively. Since 3 of the pigs injected with 15 cc. of serum and virus H and 1 of the pigs injected with 30 cc. of serum and virus H were inadequately protected, whereas only 2 of 3 pigs injected with 15 cc. of serum and virus 8652 and none of 3 injected with 30 cc. of serum and virus 8652 were inadequately protected, the results might be interpreted to indicate that the variant characteristics of virus H were of a greater degree than those of virus 8652. However, this difference may be due to other reasons since, for example, the pigs treated with virus H were heavier than those treated with virus 8652.

DISCUSSION

The results of these experiments show some of the difficulties encountered in the

TABLE 4—First to Seventh Serial Passage of Virus 4552[1] Simultaneously with Serum

Passage	Pig (No.)	Estimated wt. (lb.)	Virus: Kind	Virus: Dose	BAIES[2] No. 1 (Dose): cc.	BAIES[2] No. 1 (Dose): cc./lb.	Days of impaired appetite when bled	Days of febricity (104 F.) when bled	Day bled	Clinical
First	4907	85	4552	2 cc.	15	0.18	5	2	7th	D[2] on 14th day
Second	4916	45	4907	5 cc.	15	0.33	1	3	7th	D on 17th day
	4917	40	4907	5 cc.	15	0.37	1	4	7th	D on 14th day
Third	4974	80	(4916 / 4917)[3]	5 cc.	15	0.19	2	1	12th	D on 14th day
Fourth	5025	50	4974	2 cc.	15	0.30	4	*	8th	D on 11th day
Fifth	5076	50	5025	2 cc.	15	0.30	3	*	7th	D on 22nd day
Sixth	5078	55	5076	2 cc.	15	0.27	3	*	7th	D on 17th day
Seventh	5086	50	5078	2 cc.	15	0.30	3	*	7th	D on 11th day

All pigs had lesions commonly associated with hog cholera. Streptococcus sp. were isolated from the lungs of pig 4907 and Salmonella choleraesuis was isolated from the heart blood, spleen, kidneys, liver, and lungs of pig 4916. All other pigs were negative on tissue culture. Pigs 5076 and 5078 were negative on hemoculture. Hemoculture was not made of the other pigs.

[1]For description and derivation of this virus, see text, table 3, and footnote (1) in table 3A. [2]BAIES = BAI experimental serum; D = died or killed when moribund. [3]The blood from these pigs was pooled and used in the dose indicated. *Temperatures were not taken.

TABLE 4A—Results of Test for Variant Characteristics of Virus 5086[1]

Group	No. of pigs	Ave. estimated wt. (lb.)	Virus (2 cc.)	Serum Kind	Serum Dose cc.	Serum Dose cc./lb.	Number of pigs giving various reaction N[3]	Sl[3]	Sv[3]	D[3]	Pigs adequately protected[5] (%)
A	2	60.0	5086	BAIES[4] No. 1	5	0.08	0	0	0	2	0
B	2	55.0	5086	BAIES No. 1	15	0.27	2	0	0	0	100
C	2	65.0	5086	BAIES No. 1	25	0.38	2	0	0	0	100
D	2		5086		0	----	0	0	0	2	0
E	2	57.5	Var. 9096[2]	BAIES No. 1	5	0.09	0	0	1	1	0
F	2	57.5	Var. 9096	BAIES No. 1	15	0.26	1	0	1	0	50
G	2	62.5	Var. 9096	BAIES No. 1	25	0.40	2	0	0	0	100
H	2		Var. 9096		0	----	0	0	0	2	0
I	2	60.0	BAI 298[3]	BAIES No. 1	5	0.08	0	1	1	0	50
J	2	52.5	BAI 298	BAIES No. 1	15	0.28	2	0	0	0	100
K	2	60.0	BAI 298	BAIES No. 1	25	0.42	2	0	0	0	100
L	2		BAI 298		0	----	0	0	0	2	0
M	2	57.5	Var. 9096	C[6] 14	15	0.26	2	0	0	0	100
N	2	52.5	Var. 9096	C 14	25	0.48	2	0	0	0	100
O	2	55.0	BAI 298	C 14	5	0.09	0	2	0	0	100
P	2	57.5	BAI 298	C 14	15	0.26	2	0	0	0	100
Q	2	52.5	BAI 298	C 14	25	0.48	2	0	0	0	100

All pigs had lesions commonly associated with hog cholera. All pigs except 5 were negative on tissue cultures. The 5 pigs came from groups A, D, F, and L. None of the microorganisms isolated were identified as pathogens for swine.

[1]For derivation of this virus, see table 4. It was the seventh passage with serum of the fourteenth passage without serum of the ninth passage of virus A with serum. [2]For description and derivation of this virus, see text and tables 2 and 2A. [3]Regular unphenolized virus. Its minimum lethal dose was 0.00001 cc. forty-one days after preparation.

[4]BAIES = BAI experimental serum; N = normal (no impairment of appetite); Sl = slight reaction; Sv = severe reaction; D = died or killed when moribund. [5]Pigs were considered adequately protected if they did not have more than a slight reaction. [6]Commercially prepared serums are designated by the letter "C".

TABLE 5—Result of Test for Effects of Age and Freezing Temperatures on Variant Characteristics of Hog Cholera Virus

Ave. est. wt. (lb.)	Serum Kind	Serum Dose cc.	Serum Dose cc./lb.	Results[3] After treatment with 2 cc. of virus H[4]	8652[4]	304[4]	Bacteriology[4] Heart blood	Spleen	Kidney	Liver	Lungs
115.0	BAIES[1] No. 1	5	0.04	2/2	—	—	P	—	—	P	P and Ps
110.0	BAIES No. 1	15	0.14	2/2	—	—	P	—	P and E	—	P
90.0	BAIES No. 1	30	0.33	0/2	—	—	—	—	—	—	—
		0	—	2/2	—	—	P	S and P	Ps	S	P
92.5	BAIES No. 1	5	0.05	—	2/2	—	—	—	—	—	St
62.5	BAIES No. 1	15	0.24	—	1/2	—	—	—	—	—	—
75.0	BAIES No. 1	30	0.40	—	0/2	—	—	—	—	—	—
		0	—	—	2/2	—	—	—	—	—	—
77.5	BAIES No. 1	5	0.06	—	—	0/2	S	S	S	S	S
77.5	BAIES No. 1	15	0.19	—	—	0/2	—	—	—	S	—
70.0	BAIES No. 1	30	0.43	—	—	0/2	—	—	—	—	—
		0	—	—	—	2/2	S	S	S	S	S
90.0	C 15[2]	5	0.05	1/1	—	—	—	—	—	—	—
100.0	C 15	15	0.15	1/1	—	—	—	P	P	P	P
110.0	C 15	30	0.27	1/1	—	—	—	—	—	—	—
		0	—	1/1	—	—	—	—	—	—	—
100.0	C 15	5	0.05	—	1/1	—	—	—	—	—	—
80.0	C 15	15	0.19	—	1/1	—	—	—	—	—	—
80.0	C 15	30	0.37	—	0/1	—	—	—	—	—	—
		0	—	—	1/1	—	—	—	—	—	—
65.0	C 15	5	0.08	—	—	0/1	—	—	—	—	—
65.0	C 15	15	0.23	—	—	0/1	—	—	—	—	—
110.0	C 15	30	0.27	—	—	0/1	—	—	—	—	—
		0	—	—	—	1/1	—	—	—	—	—
		Total with 5 cc.		3/3	3/3	0/3					
		Total with 15 cc.		3/3	2/3	0/3					
		Total with 30 cc.		1/3	0/3	0/3					

All pigs which died had lesions commonly associated with hog cholera.

[1]BAIES = BAI experimental serum. [2]Commercially prepared serums are designated by the letter "C". [3]Numerator indicates number of pigs which had a severe reaction, were killed when moribund or died; denominator indicates number of pigs treated. [4]For description of these viruses, see text. [5]Where no entries were made (—), tissue culture was negative; P = Pasteurella suilla from 1 pig; Ps = Pseudomonas from 1 pig; S = Salmonella choleraesuis from 1 pig; St = Streptococcus sp. from 1 pig; E = Escherichia coli from 1 pig.

attempts to isolate a stable, pure strain of variant hog cholera virus. By passing variant virus in swine injected simultaneously with a limited quantity of serum, it has been possible to perpetuate virus with variant characteristics. However, when such a virus has been passed in pigs without simultaneous injections of serum, the virus, after a varied number of passages, has been changed so that it is counteracted by a dose of serum which previously failed to do so. The dose of serum commonly used is 15 cc., since all commercial serums must pass rigidly controlled tests under government supervision in which this amount of serum must protect adequately all pigs used in the test. As many as 2,500 lots of serum may be produced in one year. In each test, a minimum of 5 pigs are injected with serum. These records provide a sound basis for using this amount of serum as a standard in testing viruses for variant characteristics. Nevertheless, it is recognized that lesser quantities of serum might show differences in viruses even though they are counteracted by 15-cc. amounts.

These experiments show that it is possible to maintain variant characteristics of variant hog cholera virus through seven serial passages, provided it is preceded by serial passages with serum, but possibly not through the fourteenth serial passage. Efforts to obtain a pure, stable variant virus are continuing, since such a virus might be most helpful in determining more specifically the nature of the factors which are responsible for the differences in regular and variant virus. Once this is accomplished, a study of mixtures of these viruses could be more profitably undertaken.

In a previous report,[1] it was shown that the weight of pigs was an important factor in regard to the amount of serum required for protection. This observation was in accord with earlier observations over the years, which resulted in recommendations of dosage of serum in accordance with weight.

In the studies reported here, it is shown that the weight of the pig may also be a deciding factor in the perpetuation of the variant characteristics of a virus.

When the fourteenth serial passage of virus A, following nine passages with serum, failed to show outstanding variant characteristics (table 3A) and was then passed with serum (table 4), the last four passages were made in pigs weighing 50 lb. (est.). In some of the early passages of virus A, difficulty was experienced in obtaining satisfactory "breaks" when lightweight pigs were used. When pigs of light weight were used, the 15-cc. amount of serum nears the minimum protective dose and serial passage in such pigs might provide a means of neutralizing the variant virus.

SUMMARY AND CONCLUSIONS

A commercial hog cholera virus responsible for postvaccination losses in 1949 and shown to have variant characteristics was passed serially nine times simultaneously with serum (table 1) and followed by seven serial passages without serum (table 2). The ninth passage with serum retained its variant characteristics as also did the seventh passage without serum. When similarly tested, the fourteenth passage (table 3) did not retain like variant characteristics. Passing the virus seven more times simultaneously with serum (table 4) failed to cause the reappearance of variant characteristics. Thus, variant hog cholera virus may be prepared by either of the first two procedures (tables 1 and 2), but not by either of the last two procedures (tables 3 and 4).

Variant characteristics of a variant hog cholera virus were maintained after storage at -70 C. for 1,197 days and also of a variant virus stored for 439 days at -70 C. and an additional 740 days at -40 C.

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Aërosol Treatment for Lungworms.—Sheep and cattle with lungworm infections were treated with various anthelmintics as aërosols, some of which were fairly effective. Slowly absorbed oily solutions were most beneficial while alcoholic solutions, which penetrated the membranes, were dangerous.—*Vet. Bull., Jan., 1954.*

The Hemorrhagic Syndrome of Chickens

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THIS PRELIMINARY report concerns clinical, hematological, and histopathological observations on a hemorrhagic disease of growing chickens. Necropsy findings were characterized by hemorrhage in various sites, pale blood, and fatty bone marrow. Liver necrosis and intestinal ulcers were often associated with this condition during the terminal stage of the disease. Data from blood studies, in general, revealed varying degrees of clotting time prolongation, lowered hematocrit and hemoglobin values, and significant fluctuations in cell counts, especially of those cells formed in the bone marrow.

During the past three years, Faddoul[4] has observed a hemorrhagic disease in chickens brought to the Waltham Diagnostic Laboratory of the University of Massachusetts. More recently, a "hemorrhagic syndrome" of chickens was reported by Baker and Jaquette.[1] Since our findings resembled closely those described in these reports, it is our opinion that we have studied the same condition.

Our series of cases included several breeds from flocks of 1,000 to several thousand chickens. Examinations were made on 102 birds from eight flocks. The majority of affected birds were 6- to 9-week-old males. One flock consisted of 14-week-old pullets.

Most of the affected flocks were raised for the broiler market. Generally, the first signs of illness noticed were an increase in mortality, pale combs, and diarrhea. Increased excitability was reported by one owner. The mortality varied from a few to 40 per cent. Some birds in affected flocks were not visibly sick. Losses eventually subsided. In the early stages of this condition, coccidiosis was often suspected. It is significant that all of the flocks observed in this study were treated with anticoccidial drugs. Four of the eight flocks had received medication during the week in which birds were submitted to the diagnostic laboratory.

A farm visit was made to one flock of 6,100, 10-week-old cockerels. Most of the birds appeared clinically normal. Losses were confined largely to the second floor of a two-story broiler house. Sick birds were conspicuously depressed and showed progressive paling of combs from the posterior tip forward. Affected birds frequently had a marked diarrhea. Small subcutaneous hemorrhages and ulcers of the legs were seen on some birds. The owner related that sick birds generally died in one to three days.

PATHOLOGICAL FINDINGS

The gross and microscopic findings were hemorrhage, bone marrow alteration, and necrosis. A gradation of these findings was observed when several birds were examined from an affected flock. Necropsy findings of individual birds often suggested an early or subclinical stage of the condition. Necrotic lesions that developed following bacterial invasion of the liver and intestine appeared to be associated with the leukopenia that was observed in individual birds late in the course of the disease.

Extravasated blood was commonly seen in the subcutaneous tissues of the skin and legs, skeletal and cardiac musculature (fig. 2), intestinal mucosa (fig. 3), and subserosal connective tissue of the viscera. Sites less often affected were the anterior chamber of the eye (fig. 4) and the mucous membranes of the gizzard and proventriculus. Subcutaneous hemorrhage of the shanks and feet frequently resulted in the formation of ulcers. Blood was detected in the feces. Large blood clots occasionally filled the lumens of the small intestine and cecums. Large subcutaneous hematomas developed in the necks and heads of birds of one flock following hormonal implantation. Apparently, hemorrhage may occur in any vascularized tissue and its contiguous areas. Frequently, affected birds showed little or no gross evidence of hemorrhage.

Marked alteration of the bone marrow was a prominent finding in birds during a mortality peak. Typically, the bone marrow was pink to yellow, and less frequently gray (fig. 1). The consistency was generally firmer but less dense than normal marrow. Samples selected from several bones in the individual bird generally appeared similarly involved. Small areas of hematopoietic activity were observed on the periphery of a marrow cylinder. Micro-

Contribution No. 944 of the Massachusetts Agricultural Experiment Station, University of Massachusetts, Amherst.

The authors are grateful to Dr. Erwin Jungherr of the Department of Animal Diseases, University of Connecticut, Storrs, for reviewing our data, and to Miss Rose Pepi and Mr. Robert Bennett for technical assistance.

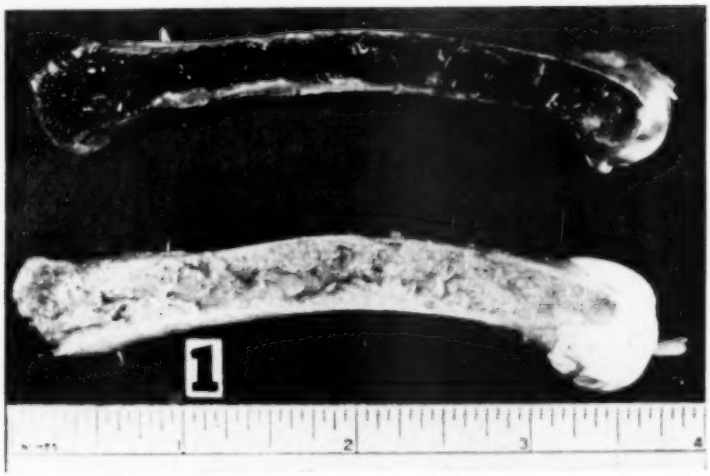


Fig. 1—Femoral bone marrow. Comparison of fatty marrow (lower) with bone marrow that represents normal condition (upper) of chickens.

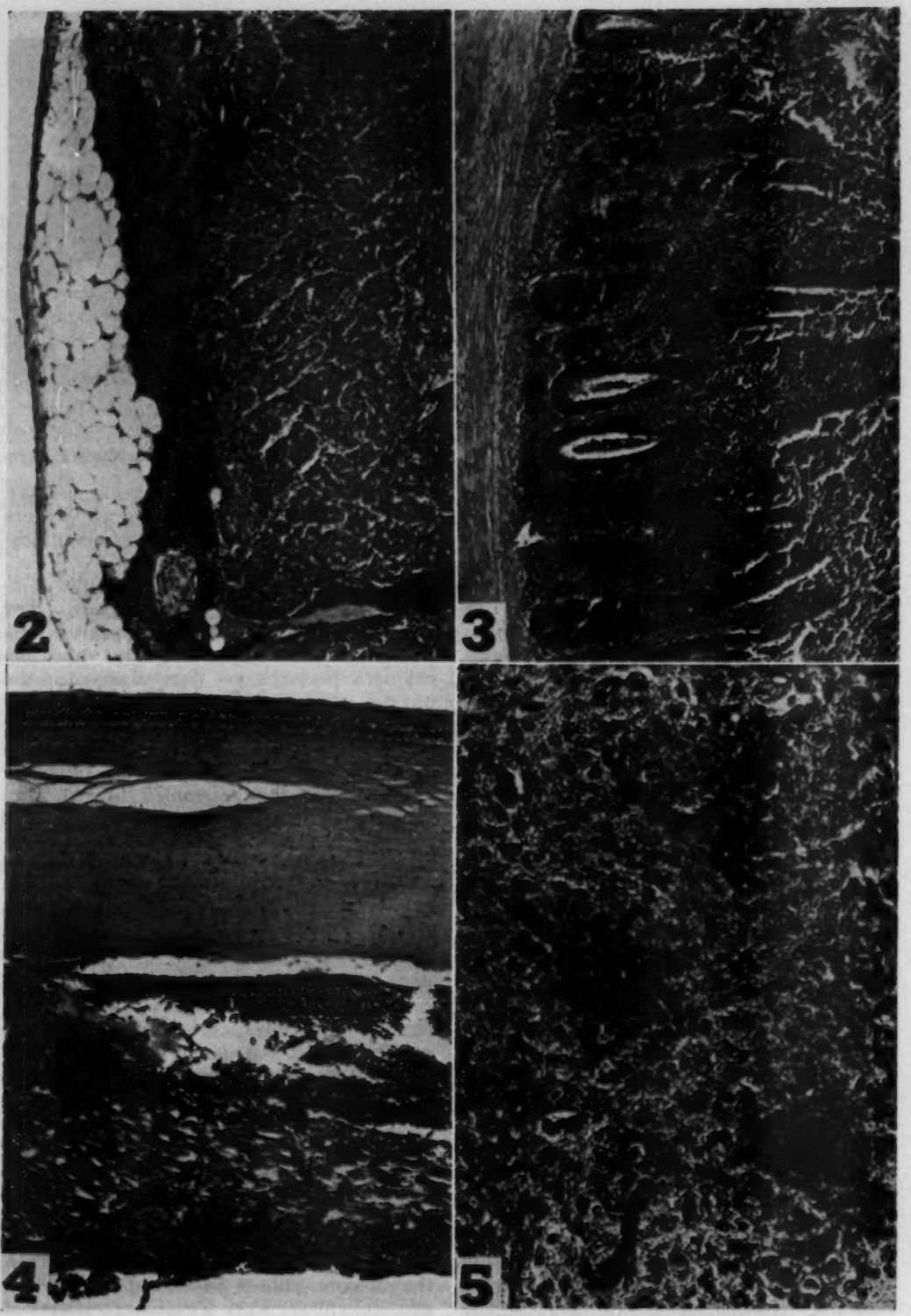
—Photograph by Robert L. Coffin

scopically, the marrow of affected birds was more or less devoid of hematopoietic elements and was replaced with fatty tissue. Most of the sinusoids were collapsed. Hypoplastic bone marrow showed conspicuous reduction of myelocytic elements. A few sinusoids, located chiefly near the periphery, contained erythrocytes. In extreme cases, only sinusoidal endothelial cells, interstitial reticular cells, and fat cells were present (fig. 6). A few lymphocytic foci were frequently seen.

Areas of necrosis were most commonly observed in the liver. These areas varied in size from random microscopic lesions (fig. 8) to massive necrosis which involved large portions of one or both lobes. Parenchyma adjacent to the surfaces and edges of the organ was most frequently involved. The organ was usually soft and swollen. The pale ocher, infarct-like lesions were sharply demarcated and were bordered occasionally by a reticulated pattern of congested vessels. Occasionally, the liver had a greenish cast due to biliary stasis. Small, raised subcapsular hemorrhage and rupture of Glisson's capsule were seen in some cases. Sections of the liver showed areas of stepwise degeneration and necrosis. Subendothelial edema and disorganization of the reticular connective tissue framework was evident. An infiltration of mononuclear cells was occasionally observed at the periphery of necrotic foci, but noticeably lacking, generally, was an inflammatory response commensurate to the widely spread tissue destruction. Septic thrombi (fig. 9) were frequently found in the large vessels related to the infarct-like lesions. Masses of bacteria in necrotic areas were generally visible with low power magnification.

The involvement of the intestines consisted of hemorrhage and necrosis. The small intestine frequently appeared distended at necropsy. Petechial and ecchymotic hemorrhages were observed in the mucosa. Ulcers in the mucosa of the small intestine and cecums were found frequently in affected birds during the terminal stage of the disease. More extensive irregular necrotic areas that resembled infarcts were also seen. In one bird, the intestinal wall was perforated. Microscopically, hemorrhage was located in the eroded tips of villi and in the deeper portions of the mucosa (fig. 3). In more advanced lesions, edema and hemorrhage separated the necrotic mucosal and muscular layers. The inflammatory response was generally minimal and consisted largely of mononuclear cells. Masses of bacteria were a frequent microscopic finding. A band of bacteria was frequently observed, with low power magnification, in the necrotic mucosa.

The gross and microscopic picture of the spleen was variable. In the terminal stage of the disease, it was usually smaller than normal and the capsule was gray. The clouded appearance was probably due, in part, to an increase in capsular thickness resulting from depletion of blood from the splenic pulp. Subcapsular petechiae and ecchymoses were occasionally observed. The pulp consistency generally appeared normal in color and texture. The histo-



All figures are photomicrographs of avian sections embedded in paraffin and stained with hematoxylin-triosin.

logical pattern often showed indistinct borders of lymphoid follicles and appeared hypoplastic. Irregular areas of hemorrhage in the red pulp were occasionally seen. Less frequently found were small hemorrhages in the adenoid sheaths (fig. 5). Large numbers of hemosiderin-bearing macrophages were often present. Hyalinized material was common in the adenoid sheaths and lymphoid follicles (fig. 7).

The kidneys appeared swollen and pale; urate deposits were not generally seen. Sections showed coagulation necrosis of the tubular epithelium in some areas. An influx of lymphocytes was frequently seen. Hemorrhage was less frequent than in organs previously described. In one section, masses of bacteria were seen in the wall and perivascular connective tissue of a branch of the renal artery.

Vascular infiltrations of lymphocytes were observed in the brains of several affected birds. This condition occurred in all regions of the brain, and the collections were not generally associated with neuronal degeneration. The mild proliferation of lymphocytes in the brain was apparently a manifestation of the generalized response by these cells that was observed in other organs. Small hemorrhages in the matrix and in the pia mater were occasionally seen. Glial foci were uncommon.

Microscopic examination of lung sections occasionally suggested a concomitant respiratory infection.

Hematological Methods and Results

Direct readings were taken from a Spencer hemoglobinometer. A correction factor for the turbidity of avian blood was not applied to these readings. Coagulation time was measured by the capillary tube method. The balanced oxalate anticoagulant suggested by Coffin[3] was used for sedimentation rate and hematocrit determinations. These two determinations were made in a Wintrobe tube except where noted. The indirect counting technique of Olson,[7] employing phloxine dye recommended by Wiseman, was used for the total leukocyte count. Using a 1:200 dilution, the total leukocyte count was computed from the formula 10/9 (number of acidophilic cells counted in hemocytometer) multiplied by 200 (100/per cent of acidophilic cells found in blood smear). Thrombocytes were also enumerated indirectly (Olson) from the total leukocyte count and differential count. A direct erythrocyte count was made on a phloxine-diluted sample. Differential counts were made from blood smears stained with Wright's stain.

Hemograms obtained from birds representative of six cases are separated in table 1 by vertical rules. Hemograms of birds in various stages of the disease were included to show the variable findings in the hemorrhagic syndrome. Since extended blood-clotting time and mild anemia were most consistently found in less severly affected birds, it was suggested that these were the earliest pathological alterations associated with the blood. Data obtained from some birds in the advanced stage of the condition were those associated with aplastic anemia, *i.e.*, anemia, agranulocytosis, and thrombocytopenia. The lack of sufficient additional hematological data on the individual bird precluded a more accurate estimation of the course of the disease.

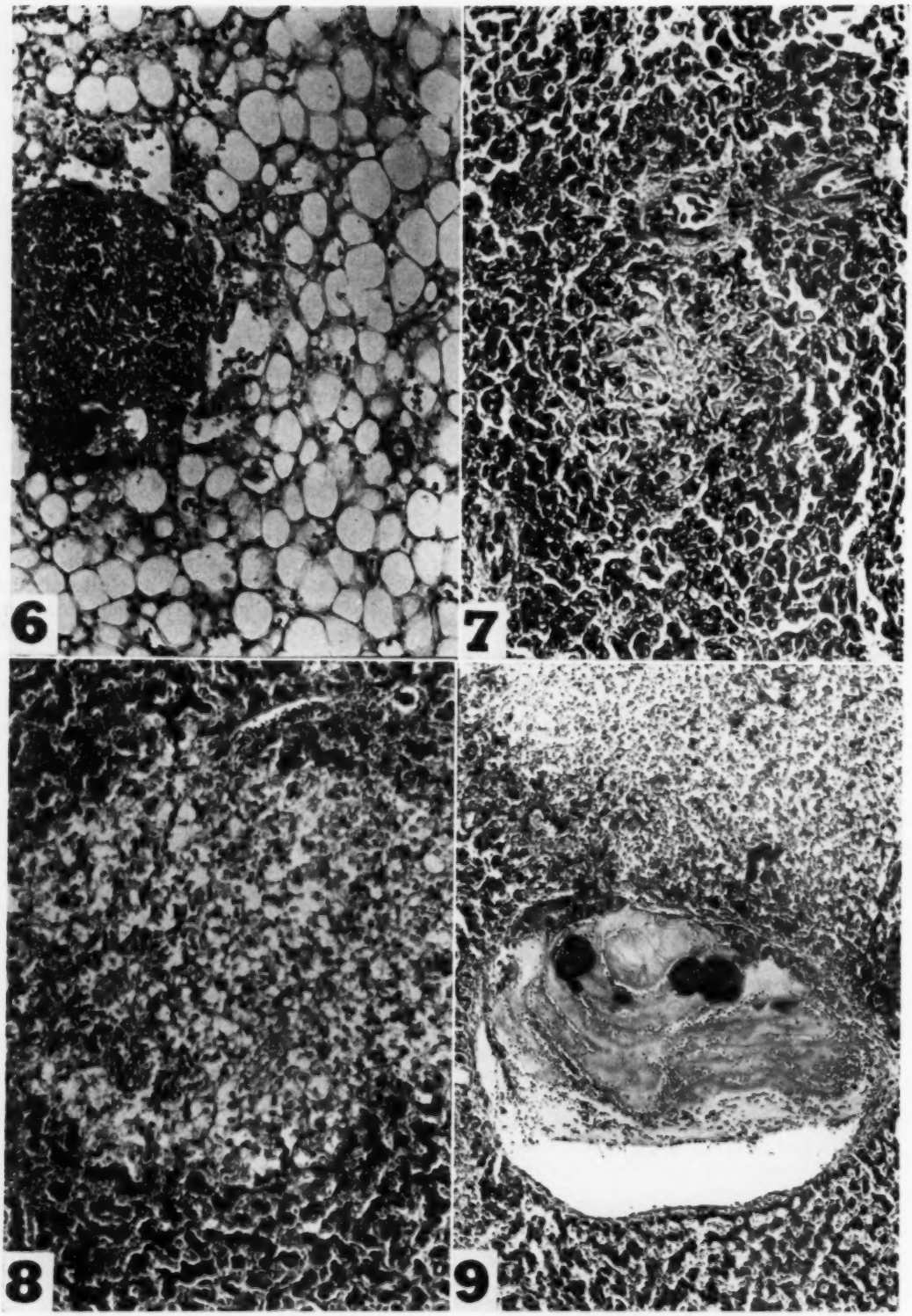
A blood-clotting time of ten minutes or longer was common. A reading of five minutes was obtained from bird 15 a few hours prior to its death.

Hematocrit values were indicative of mild to severe anemia. In a few birds, blood cell volumes as low as one-seventh of normal were recorded during the terminal stage. An increased sedimentation rate was frequently associated with blood cell counts showing pronounced reduction.

The anemia was the normocytic, normochromic type. The size of erythrocytes varied consistently. Mild polychromatophilia, poikilocytosis, and hypochromia were observed in the erythrocytic picture

Legends for Illustrations on Opposite Page

Fig. 2—Heart. Diffuse subepicardial and myocardial hemorrhage. x 156.
Fig. 3—Small intestine. Diffuse hemorrhage in the lamina propria. x 156.
Fig. 4—Eye. Hemorrhage in iris and anterior chamber. x 94.
Fig. 5—Spleen. Three microscopic hemorrhages in adenoid sheaths. x 336.



All figures are photomicrographs of avian tissues embedded in paraffin and stained with hematoxylin-triosin (except where noted).

of a few birds. Ten or more immature erythrocytes per 100 leukocytes were counted in the blood smears from 4 of the 20 birds reported in table 1. Values of less than 80 $c\mu$ for mean corpuscular volume suggested that erythrocytes were smaller than normal in a few birds. Erythrocytic counts ranged from low normal values to a fraction of a million cells per cubic millimeter. Hemoglobin values generally were decreased moderately and varied from 2.5 to 10.0 Gm./100 cc. of blood. Mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration figures were regarded as normal.

Leukocytosis and leukopenia were observed in different birds from the same flock. Marked leukopenia was usually a terminal manifestation, whereas less severely affected birds frequently showed leukocytosis. The wide range of leukocyte counts was due largely to fluctuations in the number of heterophils. Lymphopenia was generally found when the total leukocyte count was markedly reduced. When few or no heterophils were counted on blood smears, the indirect method, which was previously mentioned, was inadequate. When this occurred (table 1), the total leukocyte count was considered to be less than 5,000. In the individual bird, fluctuation in the thrombocyte count usually paralleled that of the total leukocyte count. Abnormal thrombocytes were consistently observed on blood smears. These cells were generally enlarged, more circular in outline than normal, highly vacuolated, and showed cytoplasmic projections on the cell surface (fig. 10).

BACTERIOLOGICAL FINDINGS

Birds that had died or were in the terminal stage of the disease frequently yielded various types of aërobic bacteria from such organs as the liver, spleen, and heart. These tissues also showed gross evidence of necrosis or degeneration. Isolates were usually coliform, staphylococcic, streptococcic, or Proteus species. At times, mixed cultures of these bacteria were recovered. The general pattern of isolations suggested that these organisms were opportunists that invaded the tissues only after the syndrome was well established.

DISCUSSION

A significant feature of the hemorrhagic syndrome of chickens was the variability of findings in different flocks and in individual birds in the same flock. No finding was found consistently in a marked degree. Blood counts fluctuated during various phases of the condition so that it was necessary to evaluate the hematological data with the pathological state of the individual bird. In severely affected birds in which a marked reduction of circulating blood cells originating in the bone marrow and bone marrow suppression coëxisted a designation of aplastic anemia appeared justified. This relationship was most pronounced during the terminal stage of the disease. On several occasions, reliable hematological data could not be obtained from severely affected birds in a moribund condition. Frequently, birds with the most advanced lesions were brought to the laboratory dead. In a few instances, when less severely affected birds were held for a time, bone marrow regenerated and blood counts approached normal. A compensatory increase of cell types in the peripheral circulation was occasionally suggested from a blood count of these birds.

The pathological and hematological findings reported in this paper are similar in many respects to those described by Pritchard *et al.*[8] and Sautter *et al.*[9] concerning aplastic anemia of cattle. The disease in cattle was demonstrated to be due to trichloroethylene-extracted soybean oil meal. These authors commented that chickens fed the same toxic meal as cattle were not affected. Eveleth and Goldsby[3] reported death

Legends for Illustrations on Opposite Page

Fig. 6—Femoral bone marrow. Marked hypoplasia and large solitary aggregation of lymphocytes; note the development of fat cells and the collapsed state of the sinusoids. x 144.

Fig. 7—Spleen. Hyalinized material in a lymphoid follicle. Masson's trichrome stain. x 336.

Fig. 8—Liver. Focal necrosis. x 94.

Fig. 9—Liver. Septic thrombus in a hepatic vein. Dark masses of bacteria are present in the thrombus and vessel wall. The edge of an infarct-like lesion is shown in the upper portion of the photograph. x 72.

TABLE I—Hemograms Representative of Six Field Cases of Hemorrhagic Syndrome

Bird	1	2	3	4	5	6	7
Clotting time, min.	10	>15	>20	>20	>20	15	20
Hematocrit, per cent	5	6	17	5	21	31	27
Hemoglobin, Gm./100 ml.	<4.0	<4.0	8.8	2.5	6.2	10.0	7.8
Erythrocytes × 10^6/mm.^{3}	0.59	0.74	2.7	0.77	2.0	3.1	2.4
Leukocytes × 10^3/mm.^{3}	22.9	3.8	80.0	[b]	60.0	63.0	9.5
Thrombocytes × 10^3/mm.^{3}	44.2	1.7	112.0	[c]	228.0	55.4	23.6
Differential count (cells counted)	100	100	300	0	400	100	100
Heterophils	71	58	65	0	73	48	19
Nonsegmenters	1	0	0	0	0	0	0
Eosinophils	0	0	0	0	0	0	0
Basophils	0	0	0	0	0	1	0
Lymphocytes	28	42	17	0	10	40	68
Monocytes	0	0	18	0	17	11	13
Sedimentation rate, mm./1 hr.	3.0	3.0	1.5[a]	4.5[a]	2.0[a]	1.0	1.0
Mean corpuscular, vol., cμ	84.7	81.1	62.9	64.9	105.0	100.0	112.5
Mean corpuscular, hb., Gm. × 10^{-12}	67.6	54.1	32.2	32.5	31.0	32.3	32.5
Mean corpuscular, hb. conc., %	80.0	66.7	51.8	50.0	29.5	32.3	28.9

losses, retarded growth, and lower resistance to disease in chicks fed experimentally with a ration containing trichloroethylene-extracted soybean oil meal. Leg weakness due to pliable bones, which was not observed in birds included in the present study, was also reported. Although a relative reduction of heterophilic cells was suggested from data collected by these authors, the results of their blood studies did not indicate the marked depression of blood cells shown in severely affected birds included in this study. From these reports and from the lack of evidence that this meal was fed to any of the flocks included in the present study, it was concluded that the hemorrhagic syndrome of chickens was not associated with the feeding of trichloroethylene-extracted soybean oil meal.

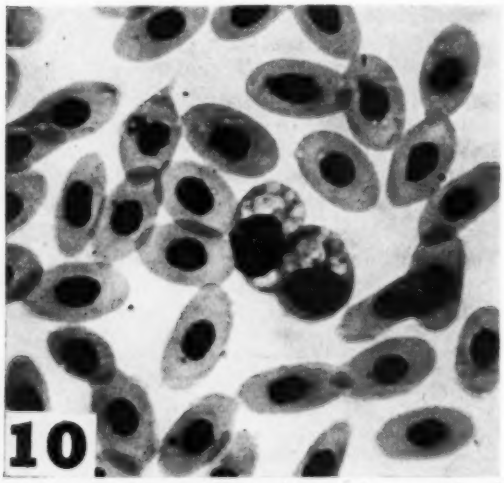


Fig. 10—Two abnormal thrombocytes in a peripheral blood smear of chickens. Of note are the enlarged size, circular outline, and abnormally vacuolated cytoplasm. Wright's stain. x 1,350.

The syndrome observed was similar, in part, to a condition characterized by subcutaneous and intramuscular hemorrhage and prolonged clotting time recently reported by Griminger *et al.*[6] in chicks fed a ration low in vitamin K. They stated that "the symptoms simulated those recently observed under field conditions and those generally associated with vitamin K deficiency." According to Follis,[5] however, no tissue changes other than severe hemorrhage have been associated with vitamin K deficiency. In view of this fact, it was not possible to relate some of our findings to a deficiency of this vitamin.

The hemorrhagic syndrome of chickens has probably been confused most frequently with intestinal diseases. The condition has been mistaken for coccidiosis. Symptoms of drowsiness, pale combs and wattles, diarrhea, and blood in the feces have generally prompted treatment level of anticoccidial medication by the flock owner. In a group of birds with intestinal ulcers, but in which generalized hemorrhages are not prominent, this condition may be erroneously diagnosed as ulcerative enteritis. The differential diagnosis will be facilitated by examination of the bone marrow and blood study data from several birds in the affected flock.

SUMMARY

Findings on 102 birds from eight flocks affected with the hemorrhagic syndrome of chickens are reported.

Pathological findings were characterized by hemorrhage, pale blood, and fatty bone marrow. Liver necrosis and intestinal ulcers were frequently associated secondari-

TABLE I (Continued)—Hemograms Representative of Six Field Cases of Hemorrhagic Syndrome

8	9	10	11	12	13	14	15	16	17	18	19	20
10	30	18	15	10	18	10	5	9	6	>15	9	13
29	27	24	24	10	25	25	27	25	23	26	29	25
8.3	8.0	7.2	8.7	4.3	7.6	7.4	8.3	5.2	6.5	7.3	9.5	8.5
2.8	2.9	2.3	2.4	1.3	2.7	2.7	2.5	2.0	2.1	1.9	2.9	2.6
80.0	47.0	6.0	15.4	[b]	25.1	70.1	[b]	[b]	[b]	[b]	[b]	[b]
250.0	51.2	16.1	32.3	[c]	32.4	35.6	[c]	[c]	[c]	[c]	[c]	[c]
300	200	50	100	25	300	300	200	200	150	150	150	50
63	57	4	22	0	21	72	1	0	0	0	2	0
0	0	0	4	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	1	0	0	0	0	0	0	0
20	35	78	52	80	66	16	89	95	96	98	94	94
17	7	18	21	20	12	12	10	5	4	2	4	6
1.0	1.0	9.0	1.5	4.0	1.0	1.0	1.0	2.0	1.0	3.0	3.5	4.0
103.6	93.1	104.3	100.0	76.9	92.6	92.6	108.0	125.0	109.5	136.8	100.0	96.2
29.6	27.6	31.3	36.3	33.1	24.4	27.4	32.2	26.0	31.0	38.4	32.8	32.7
28.6	29.6	30.0	36.3	43.0	30.4	29.6	30.7	20.8	28.3	28.1	32.8	34.0

[a] = Determined by the Cutler method; [b] = total leukocyte count was considered to be less than 5,000; [c] = thrombocyte count was considered to be less than 10,000.

ly with the condition during the late stage of the disease.

Blood studies revealed prolonged clotting time, anemia, and fluctuations in number of thrombocytes and granulocytic components of the peripheral circulation. In severely affected birds, the terminal blood picture was frequently that of aplastic anemia.

The variability of the syndrome in different flocks and individual birds in the same flock is emphasized.

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Chlortetracycline (Aureomycin) for Treatment of Bumblefoot

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Niles, California

Since no satisfactory flock treatment for bumblefoot in chickens has been developed, chlortetracycline (aureomycin)[1] was used in an experiment to determine its possible therapeutic value. One hundred and forty affected White Leghorn pullets were segregated from a flock, and wing badge numbers were applied. As the birds were handled, the severity of inflammation in each foot was classified and recorded as zero through 4 degrees (swelling and inflammation extending above the foot). The first bird handled was designated as an untreated control; the second bird received 1, 50-mg. capsule of aureomycin hydrochloride orally; the third bird received 1, 50-mg. capsule of aureomycin hydrochloride orally and was swabbed on the back with blue dye. This process was repeated until all the pullets had been handled in one of the three ways. Each chicken with a blue dye mark was given 1 capsule a day for the next two days also, making a total of 150 mg. of aureomycin hydrochloride received in three days.

Cultures of bumblefoot in untreated

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[1]Lederle: Aureomycin—Its Application in Veterinary Medicine. Lederle Laboratories Division, Pearl River, N. Y. (1952): 54.

chickens yielded *Staphylococcus albus* predominantly, and Pseudomonas sp.

The differences between experimental groups at the onset of treatment and at two weeks and four weeks later are summarized in table 1. The chlortetracycline therapy failed to reduce the lesion classification score or to cause improvement of the bumblefoot in treated birds. Therefore, this therapy can not be recommended as effective for the control of bumblefoot.

TABLE 1—The Average Rating for the Degree of Severity of Bumblefoot in Three Different Groups of White Leghorn Pullets Before and After Experimental Treatment with Chlortetracycline

Treament	Day of treatment	Two weeks later	Four weeks later	No. pullets survived
Untreated controls	1.8	1.9	1.8	46
50 mg. aureomycin HCl	1.7	1.8	1.8	46
50 mg. aureomycin HCl on each of three successive days	2.0	2.0	1.9	46

Bowel Obstruction and Incidental Abnormalities in an Aged Cat

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Philadelphia, Pennsylvania

Geriatric therapeutics is receiving considerable emphasis in the practice of small animal medicine. This case illustrates what can be accomplished when reasonable care and attention is given.

A male cat, 16 years old, had been on a ration of commercial pet food which contained meat with ground bone. The patient, when presented at the office, was depressed, dehydrated, and vomiting. The temperature was 100 F., the respirations rapid, and the cat cried and strained as if in pain and distress. The patient had been unable to defecate for three days.

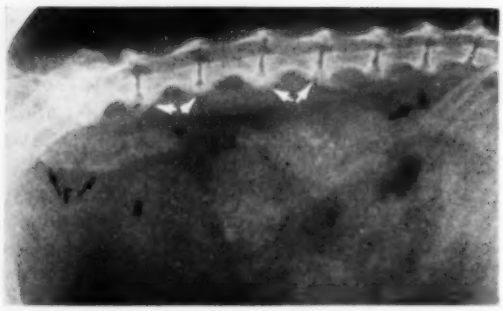


Fig. 1—Radiograph showing (white arrows) spondylitis deformans of several lumbar vertebrae; opaque fecal masses, F; calcification of the kidney, K; opaque material in the small intestine, S; and distended urinary bladder, B.

A hard mass of feces could be palpated in the large bowel and the bladder was distended with urine. A radiograph (fig. 1) showed the feces to contain a high content of opaque substance, probably bone. Besides the fecal masses and the distended urinary bladder, the radiograph showed other interesting findings, including marked spondylitis deformans of several lumbar vertebrae and calcification of the kidney.

A series of enemas emptied the bowel and as soon as the fecal masses were removed, the cat rapidly regained his normal health in spite of his illness and the incidental abnormalities. At the last report he was doing nicely.

Combined Roundworm Injury to Sheep

Two species of roundworms produced diarrhea and retarded growth in lambs, the hairworm being more injurious than the wireworm. On the other hand, the common stomach worm produced a severe or fatal anemia but seldom a diarrhea or marked loss of condition. When an infection of stomach worm was superimposed on an experimental infection with wireworm, both the diarrhea and the anemia, characteristic of such infections singly, were considerably aggravated.

In another experiment, 10 lambs were used, 5 of which were controls. Two of the principals were infected with the intestinal hairworm larvae only, a third was given wireworm larvae only, while the other 2 were given similar doses of both. The hairworm infection alone caused a more severe diarrhea than the wireworm infection alone, but the 3 lambs were not severely affected and all survived. However, the 2 infected with both parasites were severely affected, 1 dying in seventeen days, the other being sick for nine weeks.—*Rep., Chief, Bureau of Animal Industry, 1953.*

Rabies, the world's best known zoonosis, is estimated to be spread by dogs in 86 per cent of the cases, cats in 5 per cent, wild carnivores in 3.5 per cent, and cud-chewing animals in 2 per cent.—*F. A. O., June, 1954.*

Feline Adenocarcinoma of the Larynx with Metastasis to the Adrenal Gland

LEO L. LIEBERMAN, D.V.M.

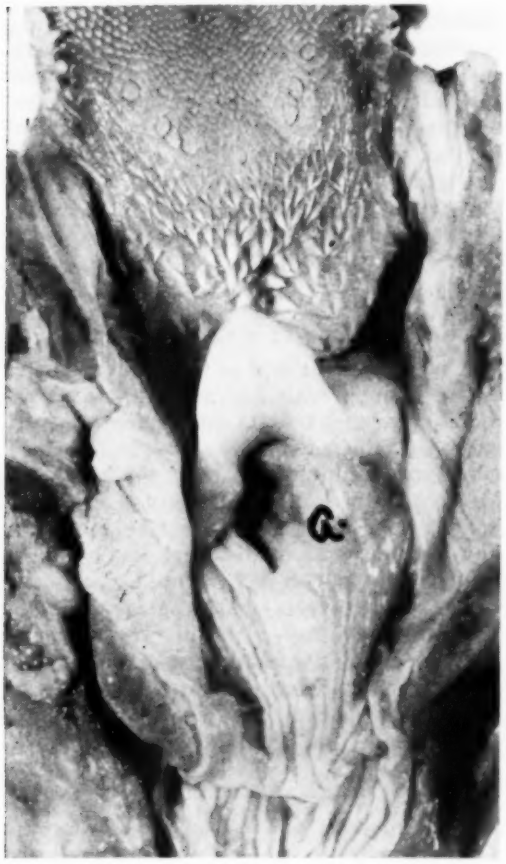
New London, Connecticut

On Jan. 3, 1953, a mixed breed, 10-year-old, castrated male cat in good condition was presented with a history of frequent spasms of coughing. In August, 1952, the "purr" had developed a different sound and the voice had disappeared completely. Enlargement of the right cervical lymph gland was found in December, 1953, when the cat became somewhat languid. This cat had frequently vomited his food, even as a kitten. The temperature was normal.

The following is the report of the findings at necropsy and the microscopic examination of the tissues submitted to the Armed Forces Institute of Pathology.

Dr. Lieberman is a general practitioner in New London, Conn.

Larynx.—A large tumorous mass bulges from the right wall of the larynx (fig. 1). This growth has destroyed the right vocal cord and infiltrates



—*Armed Forces Institute of Pathology*

Fig. 1—The larynx of the cat opened dorsally to show the adenocarcinoma (a) affecting the right wall.

—*Armed Forces Institute of Pathology*

Fig. 2—The spleen of the cat, showing many metastatic adenocarcinomas.

the submucous tissues. The tumor consists of many glandular acini. The glands in the submucosa near the base of the epiglottis are undergoing neoplastic transformation, as evidenced by the infiltration of the adjacent tissue.

Lymph Node, Cervical.—A large nodule of tumor cells has destroyed the lymph node. The adjacent skeletal muscle is being infiltrated by the neoplasm.

Lung.—Small nodules of metastatic tumor are present and are occasionally seen to be associated with a bronchus.

Spleen.—Many grossly visible white nodules are present, patterned the same as the neoplasm of the larynx (fig. 2).

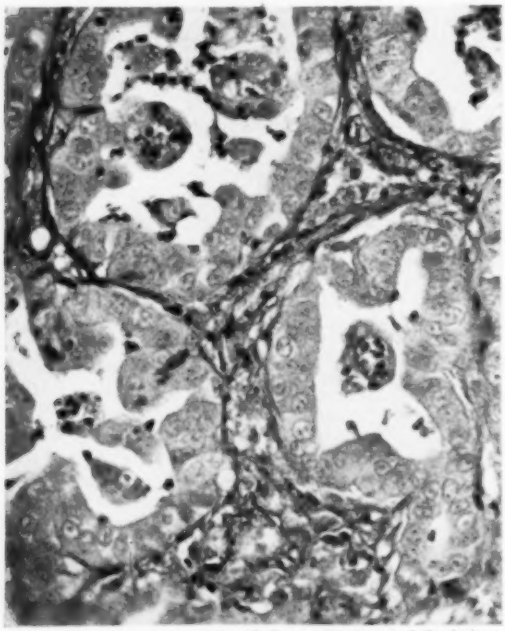
Adrenal Gland.—Grossly, the adrenal gland appeared to be cystic. The central portion of the cortex and much of the medulla have been destroyed by a neoplasm that resembles that present elsewhere.

Kidney.—No focus of tumor cells appear in the kidneys.

Intestine.—No change of pathological significance was evident in the intestine.

Liver.—Grossly, there are many nodules visible through the capsule. Attached to the diaphragmatic surface is a spongy mass which, microscopically, consists of widely dilated sinuses that are empty. The epithelial cells lining the sinuses are flat with slightly elongated nuclei and are considered to arise from the bile epithelium.

Thyroid.—In one thyroid, there is a small circumscribed nodule composed of cells with fine granular cytoplasm and oval nuclei. Follicle formation is apparent, but lacks uniformity. The material filling the follicles is less dense than that of the adjacent thyroid tissue.



—*Armed Forces Institute of Pathology*

Fig. 3—A high power photomicrograph showing details of the neoplastic glandular epithelium of the primary laryngeal tumor. x 310.

Diagnosis.—The diagnosis was (1) adenocarcinoma of the larynx and right vocal cord with metastasis to the superior cervical lymph nodes, lung, spleen, and adrenal, feline; (2) congenital malformation, bile duct origin, liver; and (3) adenoma, circumscribed, thyroid.

Comment.—The adenocarcinoma of the larynx was considered to have arisen from the glands in the mucosa of this region and rather quickly invaded the right vocal cord. The multiple nodules of the upper portion of the neck represents lymphatic dissemination of this neoplasm. The lesions in the lungs may have been the result of aspiration or hematogenous dissemination of the neoplastic cells. Regardless of which method of dissemination occurred, the lesions produced in the lung were either late metastases or were slow in growth for they were much smaller than the lesions in the spleen and adrenal gland. Mitoses were seldom seen in either the laryngeal or metastatic lesions. The growth of the mass in the larynx coincided with the observed change in the voice of this animal. The lesions of the liver and thyroid were not considered to be related to the neoplasm.

A Sarcoma Due to Radiostrontium

A muskrat captured at Oak Ridge, Tenn., where it apparently had fed on plants containing large amounts of radiostrontium, had a large osteogenic sarcoma in the right tibiofibula with metastases in the lungs and kidneys. None of the soft tissues contained harmful amounts of radioactive materials but the bones, toenails, and trachea contained unusually large amounts. The large tumor was covered with periosteum but had scarcely invaded the marrow cavities. The osteoid tissue had not calcified nor had radiostrontium been deposited in it; therefore, the tumor did not show on an autoradiogram.—*Am. M. A. Arch. Path., April, 1954.*

Feeding Antibiotics to Rabbits.—Losses from enteritis in rabbits have been reduced as much as 75 per cent by adding aureomycin and vitamin B_{12} to their pellet rations.—*Farm J., July, 1954.*

Antibiotics in Poultry Feed and Water—Use and Misuse

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Terre Haute, Indiana

THE USE OF antibiotics at low levels for growth stimulation is an accepted practice throughout the poultry industry.[1] The value of antibiotics has been so well established by nutritional research that the development and use of manufactured feeds containing these substances has been acclaimed as the greatest factor in increased gains and feed efficiency in poultry production in recent years.[2]

The general acceptance of this premise eliminates need for more than a brief review of the benefits of low-level feeding. The antibiotics commonly used are chlortetracycline (aureomycin), bacitracin, penicillin, and oxytetracycline(terramycin ®)—and there is almost universal agreement that penicillin is the most active, most consistent, and most economical antibiotic for poultry.[3]

The recommended level is 2 or 4 Gm. of penicillin per ton of feed for full activity, and 10 Gm. per ton of any of the other antibiotics. Addition of these amounts of antibiotic will increase the cost of feed by 3½ to 5 cents per 100 lb. (70 cents to $1.00 per ton) and will increase efficiency of feed utilization by 5 to 15 per cent, thus amply compensating for the added cost.

Combinations have been tried extensively and reports differ as to their value over penicillin alone. Not all combinations work the same, but properly chosen combinations are gaining in popularity on the basis of more uniform and more reliable results achieved. Combinations of penicillin and bacitracin[4] and of aureomycin and bacitracin[5] have been favorably reported in recent tests, along with various others.

How to Use Antibiotics

Antibiotics got into feeds in the first place "when nobody was looking."[6] A product known to contain what was then called APF, and fed to get the benefit of this factor, was later shown to carry an antibiotic also, and that opened the whole field. The high-level feeding of antibiotics followed gradually upon the universal feeding of low or growth-promoting levels.

Maintaining health is admittedly the biggest problem confronting the broiler producer today,[7] and a good appetite is the owner's most helpful ally in assuring health. To date, there has been little scientific experimental evidence to show the value of high-level feeding of antibiotics to prevent, alleviate, or control specific diseases. However, single infections are rare, and secondary invaders often cause more damage than the primary disease. This is particularly true of secondary bacterial infections for which primary viruses pave the way. The owner will do anything to maintain and increase feed intake during such an attack.

Poultrymen are convinced that the only practical way of medicating large numbers of chickens economically is via the ration. The manpower required for handling birds to inject antibiotics or to administer individual medication usually makes the cost of that method prohibitive. Thus, the feed manufacturer has been forced to act as a dispensing pharmacist even in the absence of experimental evidence of the value of medication. True, the absence of such evidence may be due to inability to duplicate, under experiment station conditions, those circumstances which lead to losses in laying flocks and in broiler plants. Undoubtedly, many flock owners have invested money in antibiotics and medicinal agents which were not needed, and which certainly had not been proved essential. In these cases, medication was a gamble—an investment of several dollars in antibiotics and drugs against possible losses from death or disease.

When to Use Antibiotics

The problem is to establish a more definite line for deciding when to use, and when not to use, high levels of antibiotics in the interest of safety and an adequate profit margin. As a base line for decision, feed intake is the caretaker's best barometer of health and vigor in the flock. Very few persons will recognize a change in the

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birds before appetite suffers, but every caretaker can and must compare feed consumption with that of the day before.

To some, "high level" antibiotic feeding, means adding as little as 50 Gm. of antibiotic per ton of feed, to others as much as 200 Gm., with an average of about 100 Gm. per ton. To some, it means constantly feeding such amounts from hatching to market. To a few, it means using medicated feed for a few days in anticipation of a period of stress, and for the short time when feed consumption is below normal. The latter appears to promise the greatest return per dollar invested.

However, if specific medication is to produce favorable results, an early and accurate diagnosis is of paramount importance. Every veterinarian has the basic training in recognizing and treating disease. Those who have kept up to date by reading veterinary journals and attending poultry clinics are the poultryman's best helper. Those who, busy with other animals, have neglected poultry, may find they are by-passed for another veterinarian with a better background in poultry problems and with an interest in keeping that knowledge active. If no interested veterinarian is available, the owner must turn elsewhere—to a poultry pathologist or a diagnostic laboratory.

MISUSE

Use and misuse are relative terms which, when applied to such medication, can not be expressed in grams per ton of feed, in units per pound of body weight, or in any other definite manner. The terms must be conservatively used, and the interpretation modified for each flock and for each occasion. The only logical basis for distinguishing between use and misuse is to seek the point at which feed intake and utilization of feed remain high, while the cost of the feed per dozen eggs or per pound of market bird is low. Feeding antibiotics at uneconomic levels is to misuse them.

For example, antibiotics are being misused when the medication is at such a high level that one wonders whether the function of the feed in the sack is to serve as a vehicle for the drugs rather than to provide an adequate ration for economical growth.[8]

Misuse must be admitted when the medicinal agents are added without regard to combinations, or to antagonistic or incompatible reactions of the several ingredients. At the other extreme, including antibiotics and drugs at levels which are too low for effective action must also be classed as misuse.

When the medication in the feed is of such a nature that it makes the meat or eggs unpalatable to man, or in any way dangerous to the health of human beings, that is definitely misuse of the drugs.

WATER MEDICATION

To supplement the basic ration, and particularly to anticipate, whenever possible, a decreased feed consumption, antibiotics may be added to the drinking water to insure the daily requirement. It is enough of a handicap to have an invasion by disease-producing organisms and a reduced feed consumption without also a reduction in antibiotic at the same time to weaken the body defenses when they are most needed.

On the other hand, prompt addition of supplementary antibiotic to the drinking water will usually improve the appetite and hasten return to normal health and vigor.

The periods of stress, when added antibiotics will insure the best return per dollar invested, can sometimes be anticipated. These may be listed in the order in which they usually occur: (1) during the first few weeks of life; (2) when vaccinating; (3) when moving from battery to pen; (4) when debeaking; and (5) when the temperature is falling or humidity is rising.

For the laying flock, two other periods are important—when moving from range shelter to laying house, and when adding cockerels.

Conditions which appear unexpectedly and which should signal a need for extra antibiotic in the water are a drop in feed consumption and/or sniffling or sneezing.

Duration of the water supplementation must be determined by the caretaker. For vaccinating, moving, and debeaking, a three-day period starting the day before the work is performed is considered minimum. The rate of feed consumption should determine the need for continuation. For the other stress periods, rapidity of response should determine how long to continue after the minimum three days.

Probably the greatest danger from prolonged feeding of high levels of antibiotics

is that it tends to build reliance on the disease-preventing powers of the antibiotic rather than on a sound program of sanitation and management. Any time an antibiotic or a drug is used as a substitute for adequate feeding and cleanliness, that becomes misuse in its most dangerous and most costly form.

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[5]Lewis, R. W., and Sanford, P. E.: Use of Equivalent Levels of Antibiotic and Vitamin B_{12} Supplements with Cottonseed and Soybean Oil Meals in Chick Diets. Poult. Sci., *32*, (March, 1953): 264.

[6]Bird, H. R.: Uses of Antibiotics at High Levels in Poultry Feed. Feed Age, Nov., 1953.

[7]Robertson, E. I.: Does High Level Antibiotic Feeding Pay? Feed Age, Nov., 1953.

[8]Levine, P. P.: Use and Abuse of Medicants in the Feed. Feeds Illustrated, *5*, (Jan., 1954): 8.

A New Type of Cattle Lift or Sling

W. H. BOYD, D.V.M.

Sacramento, California

An instrument for lifting cattle, "downers" or cows paralyzed after calving, was often desired during my years of practice. Approximately one year ago, I designed such a cattle lift or sling* (fig. 1, 2) which has been used on 7 cows, 4 of which made a satisfactory recovery.

This 25-lb. steel sling is shaped like ice tongs with adjustable loop tips to grab the tuber coxae. The loops can be tipped with bolts and the width of the sling can be adjusted with a tie rod. Rubber pads under the loops protect the animal from friction injuries.

Any power lift, such as is found on a tractor, or a tripod with block and tackle, can be used to support the animal for any desired period, usually from thirty to sixty minutes twice a day. This method of lifting is superior to others such as tail lifting,

Fig. 1—The sling, designed by Dr. Boyd, suspending a 2-year-old heifer that had been lying down for twenty-three days.

Fig. 2—Another view of the sling suspending the heifer that had been down for twenty-three days.

which may fracture the sacrum, or an under the belly sling which, in cattle, seems to discourage the will to stand.

It has been successfully used on fat as well as thin animals but is not recommended for certain cases such as "spreaders," with serious hip joint injuries or cases of complete obturator paralysis. However, in such cases it does serve to satisfy the owner that the animal can not stand. It is contraindicated in pelvic fractures.

This sling has not been tried on a horse.

Dr. Boyd, formerly a large animal practitioner and meat inspector for the U.S. Bureau of Animal Industry, has retired from practice.

*Patent pending.

NUTRITION

Vitamin D—Parturient Paresis Preventive

MORRIS ERDHEIM, D.V.M.

Chicago, Illinois

The recent work of Hibbs and Pounden[1] at Ohio State University, on the use of massive doses of vitamin D to the preparturient cow to ward off parturient paresis, prompted our use of this procedure in a cow prone to this disease.

The cow, a registered Holstein-Freisian born in November, 1942, had developed parturient paresis after her last four calvings, and in each of the last two, she had to be re-treated twelve hours after the initial therapy. In each instance, within six to sixteen hours after parturition, symptoms had developed to the stage where she was unable to rise and treatment consisted of 500 cc. of an approximately 20 per cent calcium gluconate and dextrose solution given intravenously. This year, she was given 15 million units of vitamin D (Dawe's dry D_2) twice a day on the feed for five days prior to her calving date, the first dose being given March 6, 1954. On March 12, she delivered a normal heifer calf weighing 85 lb. She was milked one-third dry the first day, two-thirds dry the second, and completely dry the fourth day after freshening. No signs of parturient paresis developed.

Milk Production.—This cow has a lifetime record of about 4,000 lb. of butterfat and 119,000 lb. of milk. This year, after freshening on March 12, the D.H.I.A.* tester reported her production on March 20 as 65.6 lb. of milk with 4.9 per cent butterfat; on March 29, 71.8 lb. of milk; and on April 11, 77.0 lb.

By way of comparison, this cow's daily average milk production for the past four lactations are: November, 1949—74.2 lb.; November, 1950—86.2 lb.; November, 1951—71.3 lb.; and September, 1952—70.7 lb.

Apparently, the milk production was not suppressed by the vitamin treatment.

Summary.—(1) An 11-year-old Holstein-Freisian cow disposed to parturient paresis was given 30 million units of vitamin D each day for five days before she was due to freshen. (2) Parturient paresis did not develop. (3) Milk production was not suppressed by the treatment.

Dr. Erdheim was a general practitioner in Grayslake, Ill., at the time this report was made; he is now with Dawe's Laboratories, Inc., Chicago.

[1]Hibbs, J. W., and Pounden, W. D.: Vitamin D Seen as Aid in Warding Off Milk Fever, AFMA Nutr. Abstr., Jan., 1954.

*Dairy Herd Improvement Association.

Experimental Tocopherol Deficiency in Young Calves

(An Abstract)

J. W. SAFFORD, D.V.M.; K. F. SWINGLE, Ph.D.; H. MARSH, D.V.M.

Bozeman, Montana

Six newborn male calves were placed on a tocopherol-deficient, synthetic milk ration. Two of these, as controls, were given a supplement of 148 mg. of *d-alpha*-tocopherol acetate daily.

Symptoms of muscular dystrophy first appeared in the 4 calves on the *alpha*-tocopherol-deficient ration between the ages of 12 and 24 days. The control calves remained normal throughout the experiment.

Though all of the deficient calves exhibited the same general symptoms, there was a difference between breeds in the order of appearance and in the severity of certain symptoms. All experienced a difficulty in sucking the rubber nipple, toe spread, and a general muscular weakness resulting finally in an inability to get to their feet. In the case of the Holstein-Friesian calves, a pronounced winged scapulae condition preceded the general muscular weakness, whereas the Jerseys exhibited a lowering of the fetlocks, which did not appear in the Holstein-Friesians.

In general, the symptoms were identical with those regularly observed in the skeletal form of "white muscle" disease as it occurs among Montana calves, *i.e.*, winged scapulae, stiff front leg action, flexed carpal joints, trembling while standing, normal appearance while lying, difficulty in nursing, and a tendency to remain lying. No changes in rectal temperatures occurred. Only 2 of the 4 deficient calves lost weight following the development of severe muscular dystrophy.

Electrocardiogram tracings from the deficient calves had a longer average P-R and Q-T interval than did those of control calves.

Alpha-tocopherol was not detectable in the

The original article appeared in the American Journal of Veterinary Research, 15, (July, 1954): 373-384.

blood plasma of the 4 deficient calves until the symptoms of muscular dystrophy had become severe, when unexplainably it was detected in amounts varying from 15 to 285 μg./100 ml. of blood plasma. The occurrence of the syndrome was not accompanied by abnormal erythrocyte, leukocyte, or differential white cell counts. The hemoglobin content of the blood was not altered.

Albuminuria and the detection of occult blood in the urine coincided with the development of muscular dystrophy in 1 of the deficient calves, but in none was there a change in the color, the pH, or the specific gravity of the urine. The urine samples were at all times negative to acetone, diacetic acid, glucose, and bile. Creatinuria did not occur.

Gross and microscopic lesions of the kidneys from the calf with albuminuria were similar to the changes in the kidneys occasionally observed in field cases of "white muscle" disease in lambs and calves. Also, the microscopic changes in the affected musculature were similar to those of field cases.

Following the development of advanced muscular dystrophic symptoms, *alpha*-tocopherol acetate was administered subcutaneously in 2 of the deficient calves. One calf received 890 mg. on the forty-fifth day, 500 mg. on the forty-seventh day, 1,000 mg. on the forty-ninth and fiftieth days. The other calf received 1,000 mg. on the forty-fourth day, 500 mg. on the forty-sixth, and 1,000 mg. on the forty-eighth day. Symptomatic improvement was noted twelve hours following the first injection of *alpha*-tocopherol acetate. Improvement continued and recovery appeared complete following the last injection.

Carbohydrates in a Baby Pig Diet

While dextrose, lactose, dextrin, or corn starch produced equally good gains and survival rates when used in a ration for pigs 7 to 35 days of age, sucrose produced severe diarrhea and death in 40 per cent of such pigs. In pigs under 7 days old, sucrose produced death in all the pigs in about four days. It apparently remains in the lumen of the gut where it possibly acts as a hydragogue.—*A.F.M.A. Nutr. Abstr., March, 1954.*

Pigs Raised Without Colostrum.—It has again been demonstrated that newborn animals can be raised without colostrum if exposure to disease is prevented. Pigs taken by hysterectomy or caught in a sterile bag and placed in sterile quarters were raised for eight weeks on various purified rations. No antibiotics were added.—*J. Agric. and Food Chem., April 28, 1954.*

Hormone for Fattening Steers

When fattening steers were given a daily dose of diethylstilbestrol in their feed, their rate of gain increased proportionately. While controls gained 2.23 lb. per day on 940 lb. of feed per 100 lb. of gain, steers fed 11 mg. daily gained 3.06 lb. per day on 756 lb. of feed for a 100-lb. gain. (This hormone is not available for feeding, patents having been applied for.)—*Iowa State College, A. H. Leaflet 189, Feb., 1954.*

[Note.—Its effect when fed to females will be watched with interest.—ED.]

Stilbestrol Promotes Lamb Growth

When 42 lambs were divided into three equal lots on the same adequate ration, the lot given 12-mg. stilbestrol implants gained 19 per cent faster than the controls at a cost of $13.82 per 100 lb. gain, compared to $16.43 for the controls. The lot given 1,000-unit bacitracin implants gained more slowly and the cost was higher than for the controls.—*North Dakota Agric. Exper. Sta. Bull. No. 3, 1954.*

(Meat of stilbestrol-injected animals has not been approved by the F.D.A. for human consumption.)

Magnesium Deficiency in Ducklings.—When young ducks lack magnesium, growth is retarded and incoordination, convulsions, and death may result. For maximum growth, a ration should contain 0.05 per cent of magnesium.—*J. Nutr., No. 2, 1953.*

Hormones are being used experimentally as growth stimulators in livestock, but they have been approved by the Food and Drug Administration only for use in chickens. They are not available for other animals. —*L. E. Harris, Ph.D., Nebraska.*

Protein Requirements of Baby Pigs.—The level of protein required for maximum growth by baby pigs decreases as their weight and age increase. Very young pigs grow best on rations containing 41 per cent protein but, by 8 weeks of age, a 20 per cent level is sufficient.—*J. Nutr., Aug., 1953.*

EDITORIAL

The Activities of U. S. Veterinarians in 1954

The type of professional activities engaged in by veterinarians changes little over the years but the relative numbers engaged in these various activities may change considerably.

Following each biennial edition of the AVMA Directory, a type-of-work analysis is made, based on what those listed have reported as their major field of service.

TABLE 1—Professional Activity Breakdown of Veterinarians in the United States (Based on 1954 AVMA Directory Data)

	(No.)	(%)	(No.)	(%)
TOTAL VETERINARIANS LISTED			16,641	100.0
	(No.)	(%)		
General practice	8,817	53.0		
Special practice—cattle	213	1.3		
Special practice—horses	114	0.7		
Special practice—poultry	39	0.23		
Special practice—sm. anim.	1,703	10.2		
Special practice—sheep	1	.....		
Special practice—swine	26	0.16		
PRACTICE — ALL KINDS	10,913	65.59	10,913	65.6
Teaching only	141	0.8		
Research only	199	1.2		
Teaching and research	382	2.3		
TEACHING AND RESEARCH—ALL	722	4.3	722	4.3
Gov. service—federal	1,321	8.0		
Gov. service—state	655	4.0		
Gov. service—county & mun.	286	1.7		
Vet. Corps—Army & Air Force	541	3.3		
ALL GOVERNMENT SERVICE	2,803	17.0	2,803	17.0
Commercial			261	1.5
Inactive and retired			842	5.0
Other classifications (miscellaneous)			238	1.4
No classification indicated			862	5.2
Total			16,641	100.0

Small but significant shifts in activity percentages are indicated by comparing the data compiled from recent directories, while major trends are more positively shown by such comparisons with earlier directories. Some of these trends if they are due to exceptional demands, such as the recent increase in teaching personnel due to a sudden 70 per cent increase in veterinary schools, may be of short duration. However, most of the changes indicate definite trends of a more permanent nature such as the increase in specialized practices.

A comparison of data from the 1954 Directory with that from the 1952 edition indicates: (1) an increase in the practitioner group of 1,219 (2.3%), including an additional 816 in general practice, 311 in small animal practice, 69 in bovine practice and, interestingly, 24 in poultry practice; (2) an increase of 82 (13%) in teaching and research; (3) an increase of 195 (6%) in the armed forces, but only minor changes in other categories.

The group listed in the Directory as "no classification" has been reduced from 8.2 per cent of the total in 1952 to 5.2 per cent in 1954. This is the result of the persistent checking by the department responsible for the Directory.

The more definite, long-range, veterinary activity trends are indicated in table 2, which is a comparison of present data with those of fourteen and twenty-four years ago. Such long-range comparisons must not be taken too literally since the earlier data, compiled in pre-Directory days, are probably less reliable.

It should be emphasized that the last column of table 2 indicates only the changes

TABLE 2—Comparison of Veterinary Activities in 1930, 1940, and 1954.

Type of Work	1930* (%)	1940** (%)	1954 (%)	Change from 1940 (%)
Practice—all kinds	76.5	64.9	65.6	+ 0.7
Practice—small animal	?	4.9[1]	10.2[1]	+ 5.3[1]
All teaching & research	1.9[2]	4.0	4.3	+ 0.3
All gov. services	19.6	26.0	17.0	— 9.0
Commercial	2.0	2.0	1.5	— 0.5[3]
Retired & inactive	?	2.0	5.0	+ 3.0
Other classifications (misc.)	0[4]	1.1	1.4	+ 0.3
No classification	0[4]	0[4]	5.2	+ 5.2
	100.0	100.0	100.0	

*Report of the Committee on Education. J.A.V.M.A., 79, (1931): 669 (table 7).

**Report of the Executive Secretary, 77th ann. AVMA meet. J.A.V.M.A., 97, (1940): 374.

[1]A subclassification; [2]teaching only; [3]percentage so employed smaller but actual number greater; [4]not indicated in early reports.

in relative percentages. Because of the increase in total veterinary personnel from about 12,000 in 1940 to nearly 17,000 in 1954, these figures may create a false impression. For instance, while the relative change in the number of small animal practitioners since 1940 shows only a 5.3 per cent increase, their actual number has almost trebled in that time. Also, while the relative increase in the teacher-research group for some reason shows as only 0.3 per cent, their actual number probably has doubled since 1940.

On the other hand, the relative decrease of 9 per cent in all government services means only that the number of veterinarians in those services has remained about constant.

Percentage in Practice by States

Approximately two-thirds of all veterinarians in the United States are in some type of private practice but the percentage varies considerably by states, there being a 34 per cent variance from the highest to the lowest state percentage (table 3).

Obviously, the patient population (livestock and pets) is a factor in determining this practitioner percentage in the states, but concentration of nonpracticing veterinary groups is also a major factor. Thus, of the eight states with the highest percentage of practitioners, five of which are in New England, none have a veterinary school, few have large meat-packing establishments or military installations, and none is a state to which many retiring veterinarians migrate.

TABLE 3—States in Descending Order of Percentage of Veterinarians in Practice—All Kinds

State	(%)	State	(%)
Connecticut	80.4	Illinois*	65.5
Vermont	79.4	Delaware	65.2
Kentucky	78.4	Oklahoma*	65.0
Maine	75.6	New York*	64.4
Massachusetts	74.2	Texas*	64.3
Indiana*	74.0	Virginia	64.1
North Carolina	73.8	Wyoming*	63.8
New Hampshire	73.1	New Jersey	63.3
Wisconsin	72.3	Nevada	63.1
Iowa*	72.1	West Virginia	63.0
Mississippi	72.1	South Carolina	62.6
Idaho	71.0	Missouri*	61.5
Ohio*	70.5	California*	60.0
Tennessee	70.2	Rhode Island	60.0
Louisiana	69.8	Arizona	59.0
Kansas*	68.8	Arkansas	58.0
South Dakota	67.6	Colorado*	57.7
Pennsylvania*	67.5	North Dakota	57.3
Oregon	67.3	Alabama**	57.0
Minnesota*	66.6	Washington*	56.1
Michigan*	66.5	Montana	56.0
New Mexico	66.0	Florida	55.3
Nebraska	65.7	Utah	49.4
Georgia*	65.6	Maryland	46.3

*Indicates states with veterinary colleges.

Connecticut heads the list with 80.4 per cent of its listed 143 veterinarians in private practice. Maryland, because of the large number of federal and military personnel in residence, is lowest with 46.3 per cent.

Of the 10,913 practitioner total for 1954, 8,817 or 80.8 per cent (53% of all U. S. veterinarians) are in general practice.

The classification of *general practice* is a catch-all term which merely indicates that the practitioner does not limit his services to one or a few species of animals. His services might be applied 99 per cent to large animals and 1 per cent to small animals or vice versa. This application varies with the individual's preference and with his location, but the average type of general practice in any state depends chiefly upon two factors: (1) the state's concentration of livestock and (2) its number of middle-sized or large cities.

The effect of these factors can be illustrated by an analysis of the data from three sources: (1) the Geographical Directory of Veterinarians in the 1954 AVMA Directory (pp. 102-261); (2) the Register of Veterinary Hospitals,* 1954 AVMA Directory (pp. 69-100); and (3) the Report of the Special Committee on Veterinary Services (*see* JOURNAL, June, 1954: 427-435, table 4).

A look at Connecticut reveals that while 85 of her 115 practitioners are listed as being in general practice, 38 of the 85 (45%) reported that they maintain hospitals, all except two of which service only small animals. Furthermore, only 34 per cent of all veterinary practice in the state is with large animals.

On the other hand, Vermont, where 55 of the 58 practitioners are listed as in general practice (two specializing in bovine and one in small animal practice), only ten of the 55 (18%) report having hospitals, four of the ten serving large as well as small animals. In this state, 91 per cent of the total practice is with large animals.

In North Dakota, which lists no small

*This was the first attempt at compiling such data and is known to be incomplete.

animal practitioners and only one hospital, 93 per cent (top for all states) of all practice is with large animals.

In California which has 802 practitioners, 395 are in general practice, 354 in small animal practice, and 53 specialize in practice with some species of large animal or poultry. About half (51%) of the state's veterinary practitioner services involve large animals.

In Iowa, which leads with 697 of its 733 practitioners in general practice, only 29 of the latter (4.2%) reported having hospitals and 92 per cent of all practice in the state is with large animals. Thus, to have an idea of what the activities of a general practitioner are, it is quite necessary to know where he is located.

We believe that data, such as is given in the above tables, are of current interest but of greater importance is their statistical value for making long-range plans for the profession.

For that reason, every member of the profession, regardless of his affiliation with any veterinary association, should feel a responsibility for the AVMA Directory data. The name of any unlisted graduate of an accredited veterinary school should be reported and any requests for statistical information from the Directory Department, such as those concerning professional activities and hospital classifications, should be answered promptly and completely. Then, when future comparisons are made, no qualifying statement would be required.

Myxomatosis in Britain

Myxomatosis first appeared in wild rabbits in England in October, 1953. In spite of immediate attempts to control it by fencing and exterminating all wild rabbits in the area, the disease soon spread to 17 areas in southern and southeastern England. Winter weather then checked its spread but it has now reappeared. To date, it has seemed to be 99 per cent fatal.

A special advisory committee now reports that, with so little known about the possible insect vectors, controlling the disease seems impossible. It is expected to spread rapidly throughout the Islands, so the committee urges that an effort be made to eliminate surviving rabbits before they can repopulate the area. The committee also recommends that existing vaccines be made available to domestic rabbit breeders through commercial channels and that the hutches be protected with mosquito-proof screens and the use of insecticides. Among other uses, the British rabbit industry supplies 35,000 to 40,000 rabbits per year to laboratories for medical research.—*Vet. Rec., April 17, 1954.*

Rabies in Tigers in India

In 1943, a tigress attacked three men, mauling one of them badly. On the same road, she then attacked two carts drawn by buffaloes, clawing and biting three more men, and the next day mauled three more persons. The following day the tigress ignored people and a motor car on a road. She had injured 18 persons, 11 of whom died of their wounds. The occupant of the car shot the tigress and Negri bodies were found in the brain.

In 1950, another tigress went from house to house in a village, mauling and biting 14 persons, one of whom died. Negri bodies were also demonstrated in her brain.

Another tiger killed several coolies but was killed when it attacked a wild buffalo. It was believed to have rabies.—*Vet. Bull., March, 1954.*

Atrophic Rhinitis in Britain

For the first time atrophic rhinitis has been confirmed in swine in Great Britain, apparently introduced by a healthy appearing Landrace pig from Sweden. As a result, the minister of agriculture and fisheries has restricted further importation of swine from Sweden, and atrophic rhinitis has been declared a disease requiring the isolation, detention, and slaughter of affected and contact pigs.—*Off. Internat. des Epizoot., May 26, 1954.*

Age Classification of 4-H Steers

In future International Livestock Expositions at Chicago, steers will be shown in three classes. Regardless of age, no steer with more than one pair of permanent incisor teeth can be shown and those shown will be classed according to weight limits. —*Univ of Nevada Agric. Exten. Service, Reno.*

CURRENT LITERATURE

ABSTRACTS

Microscopic Studies of the Bivins Papilloma Virus

Studies by electron microscopy of chorioallantoic membranes of chicken embryos infected with Bivins papilloma virus show the virus to be spherical in shape with a diameter of 55 mμ. These bodies could not be demonstrated in concentrated suspensions of normal chorioallantoic membranes subjected to the same procedure of concentration and examination. The egg-adapted papilloma virus bodies resemble the papilloma virus described by Melnick *et al.* in a previous paper.—[*Reginald L. Reagan, Edward C. Delaha, Mildred T. Stewart, and A. L. Brueckner: Electron Microscopic Studies of the Bivins Papilloma Virus. Am. J. Vet. Res., 15, (April, 1954): 323-324.*]

Gapeworm Infection in Domestic Geese

A species of gapeworm considered to be *Cyathostoma bronchialis*, Chapin, 1925, is reported from domestic geese in Minnesota. This helminth infection appeared to be responsible for extensive losses among the goslings of this flock. The morbidity in this outbreak was about 80 per cent, with a mortality of about 20 per cent. This nematode species has been previously reported from the Canada, Blue, and Bean geese in Minnesota.—[*Henry J. Griffiths, Robert M. Leary, and R. Fenstermacher: A New Record for Gapeworm (Cyathostoma Bronchialis) Infection of Domestic Geese in North America. Am. J. Vet. Res., 15, (April, 1954): 298-299.*]

Upjohn Veterinary Scope (vol. 1, No. 1) was recently launched by the Upjohn Company, Kalamazoo, Mich. Its purpose is to serve the veterinary profession in the same manner as a similiar publication has served the field of human medicine.

"Deperitonealization" of the Wall of the Rumen

An operation is described for research subjects by which the adhesion of any desired area of the rumen wall to the left flank is produced. By scraping the peritoneal surfaces, then holding them in apposition with sutures until the adhesions are secure, an area is created through which small openings could repeatedly be made for an investigation of the rumenal contents, or other purposes, without fear of producing peritonitis.—[*E. F. Ebert, B. B. Roseboom, and H. E. Dale: "Deperitonealization" of the Wall of the Rumen. Am. J. Vet. Res., 15, (July, 1954): 405.*]

FOREIGN ABSTRACTS

Examination of Bovine Sputum in North Holland

A review is submitted of the manner of dealing with bovine sputum in the struggle against tuberculosis in North Holland. The various methods of examining bovine sputum are described but preference is given to cultural methods. This cultivation is an important factor in the eradication of tuberculosis and its advantages are mentioned.—[*D. Rempt and J. C. Van der Maas: On The Microscopic and Cultural Examination of Bovine Sputa in the Province of North Holland. Tijdschr. voor Diergeneesk., 78, (Dec. 1, 1953): 988-992.*]—L.V.E.

Fertilization Record of Cattle with Brucellosis

The conception rate of herds negative to the Abortus Bang Ring (A.B.R.) test is better than that of herds where the A.B.R. reaction of the milk is positive. The stronger the reaction, the lower is the conception rate.

The conception rate of heifers and cows vaccinated with strain 19 and that of nonvaccinated heifers and cows on farms not infected with *Brucella abortus* show slight differences which are not significant.

Brucella abortus infection in a herd decreases the fertility of the cows.

Preventive vaccination with strain 19 does not decrease the fertility of vaccinated animals.—[*J. Hendrikse, K. F. Joling, and G. B. R. Willems: On the Fertilization Results of Artificial Insemination in Cattle and Infection with Brucella Bang. Tijdschr. voor Diergeneesk., 78, (Dec. 1, 1953): 982-986.*]—L.V.E.

Bovine Cesarean Operation

It is stated that this operation is now definitely out of the experimental stages. The article covers 82 cesarean sections, 69 for large fetuses; four, uterine inertia as a result of antepartum paralysis; three, stenosis of the cervix; four, irreducible torsion of the uterus; and two, prolapse of the vagina with edema extending to, and envolving, the vulva.

The authors prefer the flank operation on the standing animal. Anesthesia is of the caudal type and regional. No mention is made of paravertebral anesthesia in this series. The contraindications to the intervention are (1) dead fetus, especially if

decomposition has started; (2) weak subject, or when paralyzed for sometime; and (3) irreducible torsion of the uterus accompanied by a dead fetus. Three of the four operations for the latter category were unsuccessful in this study, 2 cows having dead fetuses in a stage of decomposition. The technique is essentially that described by American authors.—[*R. Barone, C. Sourd, and H. Vincent: L'operation Cesarienne, chez la Vache: Quelques Donnees Nouvelles, en Relation avec sa Pratique dans les Pays de gros Elevage. Rev. Méd. Vét. (April, 1954): 193-204.*]—R.F.V.

Canine Leukocyte Counts

The report covers white blood cell determinations in 210 healthy and diseased dogs of various ages. Among the diseased dogs, counts were made on those affected with distemper, hepatitis, icterus, piroplasmosis, and acute as well as chronic eczema. Of clinical interest was the marked eosinophilia in chronic eczema which was attributed to some form of allergy. The picture in acute eczema was one typical of bacterial infections.—[*P. Groulade.: Formule Leucocytaire Chez le Chien a l'etat Normal et dans Quelques etats Pathologoques. Bull. Acad. Vét. (Feb., 1954: 79-86.*]—R.F.V.

Treatment of Acetonemia

A new treatment for acetonemia is reported. Twenty cows, some associated with milk fever, received the therapy. For simple acetonemia, the author used 50 cc. of a 20 per cent solution of acetylmethionine intravenously. He reports return of appetite and disappearance of ketones in the milk and on the breath within twenty-four hours. Only 2 cows required a second treatment, three days following the initial injection. When the acetonemia is associated with hypocalcemia, the following solution is used intravenously:

Calcium chloride solution, 50 per cent	80 cc.
Solucamphor	10 cc.
Adrenalin 1:1,000	1 cc.
Solution of methionine, 20 per cent	50 cc.

It is stated that the solutiion of methionine has also proved useful in the treatment of calcium-refractory cases of milk fever and is believed to be a valuable adjunct in this type of hypocalcemia.—[*M. Lecomte: Traitement des Cetoses. Bull. Acad. Vét. (Feb., 1954): 74-78.*]—R.F.V.

Feline Infectious Myelitis

The author first observed this nondescript feline disease in the summer of 1952 in the Casablanca area. He gave it the name "infectious myelitis."

It affects cats of all ages and is usually manifest by a progressive flaccid paralysis of the hind limbs. The postmortem lesions are limited to the bone marrow where perivascularitis and neurophagia can be demonstrated. It occurs in acute, subacute, or chronic forms and some cases have been seen where the onset was inapparent. Mortality is high. The author believes the etiology to be a virus and states the disease is comparable to poliomyelitis in human beings.—[*L. A. Martin: Une Maladie non decrite du Chat: la Myelite Infectieuse. Maroc. Med. Abstr. in Rev. Méd. Vét. (April, 1954): 246.*]—R.F.V.

Publisher—The Angell Memorial Animal Hospital

In reviewing the "Angell Memorial Parakeet and Parrot Book" in the June, 1954, issue (p. 783), we erroneously gave the publisher as Winthrop-Stearns, Inc., New York City. The publisher is *The Angell Memorial Animal Hospital,* 189 Longwood Ave., Boston 15, Mass.

BOOKS AND REPORTS

Internal Parasites of Laboratory Animals

This bulletin discusses the diagnosis of parasitic infestations, factors which interfere with the diagnosis of parasitism, and the composite salt flotation-sample technique for the diagnosis of parasitism in laboratory animals. It consists of brief descriptions of the morphology, life cycle, pathology, diagnosis, control, and treatment of the common helminths and protozoa of the mouse, rat, guinea pig, rabbit, monkey, dog, and cat.

Photomicrographs of protozoa and the common parasite eggs makes possible their quick identification by means of microscopic examination.—[*Identification of Some Internal Parasites of Laboratory Animals. By Robert T. Habermann, Fletcher P. Williams, Jr., and William T. S. Thorp, U. S. Dept. of Health, Education, and Welfare, Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. 1954. Price 20 cents.*]

The Anatomy of the Bovine Foot

This book, a pictorial approach to the anatomy of the bovine foot, has 58 pages and 28 figures. On each right-hand page is an illustration, drawn by the author, of a dissection, with a description of the illustrated detailed anatomy on the opposite page.

The descriptions of the anatomical structures are brief and well written. The illustrations of each dissected area should be helpful to a student in anatomy and to a surgeon in forming a permanent visual record. This atlas should be an excellent means of reviewing the anatomy of the bovine foot.

Since the book is concerned with the detailed anatomy of the distal metacarpal, or metatarsal, and phalangeal regions, it has practical value to the veterinarian dealing with bovine surgery. The artistic effect attained by the author is commendable.—[*The Anatomy of the Bovine Foot. By Robert F. Way. University of Pennsylvania Press, Philadelphia. 1954. Price $4.00.*]—W. G. VENZKE.

THE NEWS

Oakland County Veterinary Association Again Contributes to Research Fund

Following up the contribution of $1,088.74 made by the Oakland County (Mich.) Veterinary Association (see the JOURNAL, July, p. 84), a second contribution in the amount of $2,769.90 was received from Dr. D. J. Francisco, chairman of the Oakland County Veterinary Association under date of June 15, 1954. In transmitting the check, Dr. Francisco said:

> ". . .This represents the monies left over from a series of 18 public rabies vaccination clinics held here in our county this past winter and spring. These clinics, also, were authorized by the County Board of Supervisors, with the veterinary services being donated by practitioners in the county."

It would appear that this local veterinary society has found one solution to the vexing problem of good public relations for veterinarians, when confronted with an official request for cooperation in a compulsory rabies vaccination program imposed by local governmental and public health agencies. The action taken by the Oakland County veterinarians to cooperate in a program which was professionally distasteful in its socialized medicine aspects should remove the stigma so frequently and wrongly placed on veterinarians when they are charged, by the uninformed, of helping to perpetrate a "racket" on dog owners.

Veterinary Radiology Society Organized

As an outgrowth of informal conferences of teachers of radiology in American schools of veterinary medicine, held during AVMA conventions for the past three years, the American Veterinary Radiology Society has been formed and incorporated as a not-for-profit corporation in the State of Illinois as of April 23, 1954.

The first conference was held at the invitation of Dr. W. C. Banks, Texas A. & M. College, during the convention in Milwaukee in 1951. At Toronto in 1953, the group decided to incorporate.

The purposes for which the Society is organized are:

1) to further scientific progress in veterinary radiology;

2) to encourage and promote wider use of veterinary radiology;

3) to keep the veterinarian aware of the danger of excess radiation to himself, assistants, clients, and patients;

4) to encourage adequate radiological training in the veterinary schools;

5) to provide an organization for those who have an interest in radiology.

A constitution and by-laws has been drafted for adoption by the Society at the AVMA convention in Seattle. Requirements for membership are (1) membership in the AVMA; (2) graduates of schools recognized by the AVMA; (3) good moral and ethical standing.

Serving as incorporators for the Society were Drs. N. B. Tennille, Oklahoma A. & M. College, chairman; W. C. Banks, Texas A. & M. College, secretary-treasurer; R. B. McClelland, Buffalo, N. Y., director; P. J. Meginnis, Roselle, Ill., director; and M. A. Emmerson, Iowa State College, director.

Applications for membership should be made to Dr. W. C. Banks, Texas A. & M. College, College Station, Texas.

Information on Grants for Graduate Study Abroad

From time to time, the AVMA receives inquiries from veterinarians in the United States about opportunities for graduate study in foreign countries, and also from veterinarians in foreign countries about the possibility of coming to this country for study. Such information is usually known to educational institutions but the sources of it are not generally known.

The Institute of International Education, 1 East 67th Street, New York 21, N. Y., issues several pamphlets which contain information on the following subjects:

United States Government Grants—For graduate study under the Fulbright Act and the Buenos Aires Convention.

Fellowships Abroad for American Students—1954-1955.

Graduate Study in the United States—A guide for students from foreign lands.

The Instituite also issued in February a pamphlet on "Study Abroad—Summer 1954."

Copies of these leaflets can be obtained by writing to the Institute at the address shown above.

Dr. W. G. Magrane Completes AVMA Research Fellowship

Dr. W. G. Magrane of Mishawaka, Ind., who was granted a fellowship by the AVMA Research Council last year for graduate training in ophthalmology, completed his studies at the Graduate School of Medicine, University of Pennsylvania, in June, 1954, and has re-

(Continued on page 167)

News From Washington

First Lieutenant Grade Authorized.— Senate Bill 932 (see JOURNAL, July, 1954: 86) was passed by the House of Representatives on June 22, and when signed by the President on July 1, 1954, became PL-459. This means that **when initially appointed in the Veterinary Corps of the Army or in the Air Force, the veterinarian will enter in the grade of first lieutenant** rather than as a second lieutenant. Enactment of PL-459 climaxes four years of effort by the AVMA to obtain this legislation. The AVMA officers and central office staff thank all who gave their time and effort in obtaining this legislation.

★ ★ ★

The President, on June 18, signed S-3096, an amendment to the Doctor Draft law. This amendment, now PL-403, authorizes the military to **utilize in an enlisted grade physicians, dentists, and veterinarians who decline or are ineligible for a commission.** The amendment is aimed at security risks and those who might use the Fifth Amendment to the Constitution as a shield.

★ ★ ★

The Senate Finance Committee opened hearings on the Social Security Bill (HR-9366) on June 24. In addition to the statement presented to the Committee (see JOURNAL, July, 1954: 86), the **Association has taken action which it is hoped will result in HR-9366 being amended to exclude veterinarians from compulsory coverage.**

★ ★ ★

In South Carolina and Wisconsin, all **livestock disease control and related work is now directed by a single veterinarian** in each state, selected and paid jointly by the state and the federal government. Details of operating the joint veterinary agencies were agreed to under a memorandum of understanding signed by state representatives and by the Agricultural Research Service, U.S.D.A., which is responsible for the federal phases of the work. Dr. Richard W. Carter, formerly assistant to the federal veterinarian in charge in Ohio, in his new position in South Carolina takes over the duties previously assigned the state veterinarian and those of the federal veterinarian in charge of field activities in the state. In Wisconsin, Dr. H. J. O'Connell, formerly state veterinarian, directs the new State Federal Veterinary Agency. His assistant is Dr. W. R. Winner, formerly veterinarian in charge of federal work in Wisconsin.

★ ★ ★

Brigadier General J. L. Hartman, chief, Army Veterinary Corps, retired from the Army on June 30, 1954. **Colonel Elmer W. Young, chief veterinarian, Q.M. Inspection Service Command, Headquarters Quartermaster Market Center, has been ordered to the Army Surgeon General's Office, effective August 2;** he will succeed General Hartman as chief of the Veterinary Division in that office.

★ ★ ★

The Public Health Service just published a 247-page work on the nationwide distribution of medical, dental, veterinary, and paramedical personnel. The 1950 population census was used as the statistical basis for the study. According to the published figures, there were 13,379 veterinarians, and the number per 100,000 population was 9. The volume, entitled "U.S.P.H.S. Publication 263, Section 4," may be purchased from the Superintendent of Documents, Washington, D. C.

★ ★ ★

Ninety-six veterinary graduates of 1954 classes submitted applications indicating a desire for active military service (see JOURNALS, April and May, 1954:325; 408). As of July 6, Veterinary Division, Army SGO, had requested the Department of the Army to issue orders on 60 of the total who had been processed (50 in non-R.O.T.C. category and 10 R.O.T.C. graduates). Air Force (V.C.) recruited 22 from the 1954 class. Members in this group are being processed and will receive orders to active duty within ninety days after being commissioned. In addition, **40 R.O.T.C. graduates who accepted commissions in the Air Force (V.C.) are available for entry into active service** at such time as their services may be required.

(Continued from page 165)

turned to private practice. He reported that the course work in human ophthalmology, as well as the abundance of clinical material in the veterinary school at the University, made his postgraduate training of great value.

Dr. Magrane now plans to pursue clinical research in small animal ophthalmology under the preceptorship of an American Board-certified ophthalmologist. He then expects to prepare a thesis for submission to the Graduate School of Medicine and the School of Veterinary Medicine at Pennsylvania for approval and an award of the M.S. degree.

School at Giessen, Germany, Recognized

The Council on Education of the AVMA, at its meeting on May 24, 1954, added the name of Justus-Liebig College, Giessen, Germany, to the list of recognized foreign veterinary colleges for graduates in 1953 and in years subsequent thereto.

Laboratory Refresher Courses Offered by Communicable Disease Center

From July 1, 1954, to June 30, 1955, the Communicable Disease Center, U. S. Public Health Service, Department of Health, Education and Welfare, will offer a series of laboratory training courses in laboratory diagnosis and methods of study of various disease conditions.

Information and application forms should be requested from: Laboratory Training Services, Communicable Disease Center, U. S. Public Service, P. O. Box 185, Chamblee, Ga.

STUDENT CHAPTER ACTIVITIES

Colorado Chapter.—The following is summary of the meetings and activities of the Colorado A. & M. College Student Chapter of the AVMA for the spring quarter, 1954.

At the meeting on March 31, films of some of the late Dr. Farquharson's surgical techniques and operations were shown and narrated by his son, **Dr. Bruce Farquharson.**

On April 14, a panel of practitioners composed of **Drs. Henry Cook,** Denver; **Duane Albrect,** Denver; **John Thimig,** Brighton; and **Lawrence Metzger,** Boulder, gave helpful suggestions and answered questions from the floor on the different aspects of a veterinary practice.

During the meeting of May 12, **Dr. Larson,** a graduate student from Australia, gave an interesting talk, illustrated with slides, about his homeland.

At the last meeting of the year, **Dean Floyd Cross** gave a talk about the past, present, and future of the Colorado A. & M. Veterinary College.

The Colorado Chapter, during the spring quarter, also set up a fine record socially and in intramural sports. Their float won first place in the open division of the annual College Days parade. In sports, the Chapter won the independent division in softball and was all-school runner-up in the same sport. In volley ball, the Chapter was runner-up in the independent division and won third place in the all-school track meet. In boxing, they won a decisive victory and retained the championship trophy.

The following officers served the Chapter during spring quarter: Tom Orchard, president; Bob Rolofson, vice-president; Keith Cornforth, secretary; Stuart Lovelace, treasurer; Dave Herrick, social chairman; Van Sandstedt, athletic chairman.

s/JOHN FUHR, *Reporter.*

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Cornell Chapter.—At the April 13 meeting of the Cornell University Student Chapter of the AVMA, the following officers were elected; Robert Hillman, president; Burt Halestrap, vice-president; Jane Newman, secretary; Marty Simenson, treasurer; and Dr. John Bentinck-Smith faculty advisor. John Flemmer was appointed program chairman for the coming year.

Following is a list of speakers who appeared before the Student Chapter during the spring semester: **Dr. H. K. Fuller,** Interlaken; **Dr. DeBrom,** South Africa; **Drs. R. B. McClelland,** Buffalo; **R. M. Sears,** Elkton, Md.; **Leonard J. Goss,** of the Bronz Zoo; and **W. J. Sickles,** McLean.

The Chapter's annual picnic was held at Buttermilk Falls State Park on May 27. Robert Kahrs was awarded the Keith Bond Award at this time. He was chosen by members of his class for outstanding character, personality, extracurricular activities, and professional character and attitude. The following seniors received Chapter membership awards: Helen Coates, Robert Kahrs, Burt Lewis, Henri Marsh, Garth Murray, Donald Newman, Robert Stoll, and Robert Freedman.

s/JANE NEWMAN, *Secretary*

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Iowa Chapter.—During the past year, the Iowa State College Student Chapter of the AVMA heard talks by the following speakers: **Stanley Ferguson,** Lake Geneva, Wis.; **Kenneth Smith,** Sioux City; **J. W. Sexton** and **E. C. Ritter,** Sumner; **E. Hannah,** Springville; **W. Verploeg,** Pella; **Frank Lynn,** Sheffield; and **C. D. Lee,** of Iowa State College.

During the year, the honor code of the Chapter was amended and a new interclass administrative board was set up to replace the former one.

Social activities sponsored by the Chapter included a fall banquet, Christmas party, winter dance, spring dance, and a spring picnic.

s/RUSSELL SIMONSEN, *Secretary.*

Illinois Chapter.—The annual spring banquet of the University of Illinois Student Chapter of the AVMA was held on May 15. The speaker was **Brig. Gen. James A. McCallam,** president of the AVMA, who gave an informative talk on the history of the veterinary profession and the AVMA.

General James A. McCallam, president of the AVMA, presented a charter to the University of Illinois Student Chapter of the AVMA at their spring banquet on May 15, 1954. Those in the picture are (left to right)—John Clayton, James Nadler, president; Dean Robert Graham, Arthur Bottorff, and General J. A. McCallam.

At the regular May business meeting, the following officers were elected for the fall term: James Larson, president-elect; Norman Jones, vice-president; Marlin Kleckner, secretary; and Gordon Iverson, treasurer. Dr. L. E. St. Clair was chosen as advisor. Retiring President Nadler presented the gavel to John Clayton, president for the fall semester.

s/MARLIN KLECKNER, *Secretary.*

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Kansas Chapter.—During the second semester of the 1953-1954 school year, the following guest speakers addressed the Kansas State College Student Chapter of the AVMA: **Dean E. E. Leasure, Drs. R. H. Gump,** Wichita; **R. A. Bruce,** Ottawa; **Mr. John Sjo,** Manhattan; **Drs. A. H. Quin,** Kansas City, Mo.; **M. L. Morris,** Topeka; **J. E. Luckeroth,** Seneca; **Mr. Harris,** Lincoln, Neb.; **Mr. J. Moxley,** Council Grove; **Drs. Ralph L. Barrett,** Hoisington; **William F. Irwin,** Tulsa, Okla.; **Harold L. Church,** Battle Creek, Neb.; and **P. H. Vardiman,** Richmond Heights, Mo.

The following seniors related their summer experiences in working with veterinarians: **Earl Wood, Lloyd Orsborn, Winston Goering, Charles Swenson, Bill Herberg, J. A. Sprowls, Raymond Dill, John Swanson, Francis Kaisier, Charles Schnitzler, Otto Shill, Clial McDonald, Don Shuman, Mel Worthington, Gordon Wasson, Joe Wagner, Norman Luckeroth, Dean Darling, Charles Paul,** and **Charles Haines.**

Marcus Humphrey was selected as student representative to the annual AVMA convention in Seattle.

Officers for the fall semester are: William Kvasnicka, president; Earl Gatz, president-elect; Alvin Melcher, vice-president; Frederick Day, secretary; Ernest Henderson, treasurer; Danforth Taylor, marshal; and Ross Kuttler, critic.

In intramural sports, the chapter again dominated the independent division, leading its nearest rival by more than 75 points.

The Borden Award winner this year was Winston K. Goering; the following received Phi Kappa Phi honor keys: Winston K. Goering and Louis B. Curro. Lloyd Orsborn and Otto Shill were also honored as leaders.

The average attendance for the year was more than 110.

s/JOE LANDHOLM, *Publicity Chairman.*

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Missouri Chapter.—At the regular monthly meeting of the University of Missouri Student Chapter of the AVMA on April 12, **Dr. R. B. Koger,** of Joplin, spoke and showed motion pictures on surgical procedures in small animal practice.

The Chapter established a loan fund for students of veterinary medicine.

On May 10, **Dr. H. C. Calloway,** of Waverly, spoke on swine practice; and **Dean Groth** presented chapter diplomas to the members of the senior class.

The officers for the first semester of the 1954-1955 school year are: Fon Owings, president; Harold Wright, president-elect; Leland Holt, vice-president; Gerald Johnson, secretary; Robert Hertzog, treasurer; and Dr. C. E. Elder, faculty advisor.

s/ANDERSON SNELL, *Secretary.*

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Oklahoma A. & M. Chapter.—The following is a resumé of the activities of the Oklahoma A. & M. College Student Chapter of the AVMA for the spring semester of the 1953-1954 school year.

The March 18 meeting was highlighted by two films, after which Paul Edmundson was announced as the winner of the Dean Mac Award which is given to the outstanding senior in honor of former dean, Dr. C. H. McElroy. At this meeting, Bob Hudson was chosen delegate to the national AVMA convention in Seattle, with Fred Hutton as first, and Don Hohmann as second, alternate.

A special meeting was called for March 25 to hear **Dr. George T. Edds** of the Fort Dodge Laboratories, Fort Dodge, Iowa, discuss some of the problems and practices in introducing new drugs. **Dr. R. S. Todd** of Tulsa was guest speaker at the April 1 meeting, and **Dr. L. C. Smith,** Miami, Okla., at the April 29 meeting.

At the May 6 meeting, the following officers were elected for the fall semester: Herb Justus, president-elect; Dave Swicegood, treasurer; Tony Kammerlocker, secretary; and Mick Spindel, assistant editor.

The final meeting of the year, on May 19, was the senior recognition program. The speaker was **Sandy Shor,** a graduating senior, who told of his trip to New York which he received for winning the Moss Essay Contest. Others honored were Paul Edmundson, outstanding senior; Charles Hales and Carl Wasson, Upjohn Award for work in large and small animals, respectively: Don Holmes, Paul Edmundson, and Don Patterson, elected to Phi Kappa Phi; Ray Lessart, AVMA Women's Auxiliary Award.

s/D. R. CALLICOTT, *Secretary.*

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Washington Chapter.—At the senior banquet on May 5, 1954, the following awards were presented to outstanding seniors: large animal surgery, Leroy Whitener; large animal medicine, Duane Brobst; small animal surgery, Bud Coons; small animal medicine, Bob Whitaker;

Front row (left to right)—Duane Brobst, Leroy Whitener.
Back row—David Urie, Bob Whitaker, Bud Coons.
Not pictured—Tom Newland.

outstanding contribution to Student Chapter, Tom Newland; and Women's Auxiliary to the AVMA award, David Urie.

s/JERRY HARSCH, *Publicity Chairman.*

WOMEN'S AUXILIARY

Plans Made for Pennsylvania Meeting.—Plans for the women's entertainment during their stay at Pocono Manor for the annual meeting of the Pennsylvania Veterinary Medical Association, Oct. 13-15, 1954, are being completed. A hat-making demonstration, travelogue, and sight-seeing tour are some of the activities planned for the guests. Also, the cookbook will be completed and on sale for $1.

s/MRS. B. ZACKON, *Secretary.*

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Students' Wives Receive Degrees.—When the graduates of the School of Veterinary Medicine, Michigan State College, received their D.V.M. degrees, 29 wives of members of the class received the P.H.T. (pushing hubby through) degree. All new P.H.T.'s are members of the Women's Auxiliary to the Michigan State College Student Chapter of the AVMA. Their diplomas certify that each "has achieved, through patience, endurance, and fortitude, the degree of P.H.T.," and are signed by Dean C. F. Clark and Dr. Edward K. Sales, head and director of the Department of Surgery and Medicine. To earn the diplomas, the women attended classes twice a month to learn how to run blood samples, keep a veterinarian's books, etc., and have even witnessed operations on large and small animals. The classes are designed to give the women an understanding of their husband's professions.

Members of the student auxiliary also hold social meetings once a month. Organized in 1949, it now has a membership of 116.

APPLICATIONS

Applicants — Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent associations shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative By-Laws.

BLACKWELL, JODIE G.
700 N. W. 1st St., Idabel, Okla.
D.V.M., Tuskegee Institute, 1950.

BUCKLEY, B. T.,
Fonda, Iowa.
D.V.M., Iowa State College, 1932.

MENIG, BERT A.
R. F. D. 2, Box 10-A, Ellensburg, Wash.
D.V.M., Washington State College, 1937.

THISTLEWAITE, WALTER E.
7845 S. E. 36th Ave., Portland, Ore.
D.V.M., Washington State College, 1921.

Applicants — Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative By-Laws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

First Listing

MCPEEK, RAYMOND C.
Blairstown, N. J.
D.V.M., Kansas State College, 1941.
Vouchers: J. B. Thurman and W. E. Collins.

REISINGER, ROBERT C.
56 N. W. 102nd St., Miami, Fla.
D.V.M., Alabama Polytechnic Institute, 1944.
Vouchers: R. P. Knowles and J. O. Knowles.

Second Listing

CAICEDO, CESAR A., Calle 10, No. 3-33, Apartado Aereo 12-92, Cali, Colombia, S. A.

CLARK, ASHLEY J., JR., 8419 S. Summerfield Ave., Whittier, Calif.

DAVIES, FRANK J., 2511 Etna St., Berkeley, Calif.

LEONARD, GEORGE A., 9834 Elmar Ave., Oakland, Calif.

LOWRY, ARLON M., Wanda, Minn.

SOMOANO, PORFIRIO P., Ave. Cuauhtemoc, num. 28, Acapulco, Mex.

TILLMAN, ROBERT W., 7808 Juniper, Prairie Village, Kan.

YARBROUGH, CECIL S., JR., 1103 Volusia Ave., Daytona Beach, Fla.

1954 Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

First Listing

Alabama Polytechnic Institute

BASCO, JAMES, D.V.M.
261½ Wall St., Shreveport, La.
Vouchers: R. S. Sugg and W. S. Bailey.

NELSON, DONALD B., D.V.M.
Rt. 1, Chipley, Fla.
Vouchers: G. K. Kiesel and J. H. Watt.

POITEVINT, OTTIS L., D.V.M.
405 S. Denton St., Dothan, Ala.
Vouchers: R. S. Sugg and M. S. Bailey.

SHAUL, JOHN C., D.V.M.
769 Vance Ave., Memphis, Tenn.
Vouchers: R. S. Sugg and M. S. Bailey.

STINE, ROBERT H., D.V.M.
c/o Irby Veterinary Hospital, Mobile, Ala.
Vouchers: R. S. Sugg and M. S. Bailey.

University of California

BAKER, ROBERT H., D.V.M.
818 Alta Vista Dr., Sierra Madre, Calif.
Vouchers: E. A. Rhode and T. J. Hage.

BAYMILLER, PATRICK H., D.V.M.
1018 Allerton St., Redwood City, Calif.
Vouchers: J. F. Christensen and T. J. Hage.

BREWER, ROBERT L., D.V.M.
Box 456, Oakdale, Calif.
Vouchers: J. F. Christensen and B. V. Lundberg.

BURROWS, GORDON F., D.V.M.
1038 W. 101st St., Los Angeles, Calif.
Vouchers: T. J. Hage and C. E. Cornelius.

CARROLL, ROBERT E., D.V.M.
5431 San Fernando Rd., W., Los Angeles, Calif.
Vouchers: D. E. Jasper and J. F. Christensen.

COLE, JERROLD W., D.V.M.
507-H East Valna Dr., Whittier, Calif.
Vouchers: B. McGowan, Jr., and G. D. Pettit.

DILLON, BEN E., D.V.M.
2186 Del Rio Dr., Stockton, Calif.
Vouchers: B. McGowan, Jr. and J. F. Christensen.

HARTJEN, LOUIS A., D.V.M.
9075 Palm, Bellflower, Calif.
Vouchers: E. A. Rhode and J. D. Wheat.

MCWHINNEY, BENJAMIN M., D.V.M.
413 Willow St., San Jose, Calif.
Vouchers: E. A. Rhode and J. D. Wheat.

MENGLE, HOLMES R., JR., D.V.M.
4151 Walnut, Chino, Calif.
Vouchers: B. McGowan, Jr., and T. J. Hage.

PROCTOR, LAWRENCE M., JR., D.V.M.
S. P. C. A. Hospital, 2500 16th St., San Francisco, Calif.
Vouchers: G. H. Pettit and T. J. Hage.

RIFKIND, LEO M., D.V.M.
1735 S. Burlington Ave., Los Angeles, Calif.
Vouchers: G. D. Pettit and E. A. Rhode.

ROBINSON, ROBERT R., D.V.M.
15 W. Carlton Way, Tracy, Calif.
Vouchers: D. E. Jasper and J. F. Christensen.

WEBSTER, CHARLES B., D.V.M.
1911 Hunnewell St., Honolulu, Hawaii.
Vouchers: J. F. Christensen and O. W. Schalm.

Colorado A. & M. College

SWENA, EDWARD M., D.V.M.
505 Arapahoe St., Golden, Colo.
Vouchers: W. H. Beckenhauer and W. D. Carlson.

University of Illinois

BOTTORFF, ARTHUR A., D.V.M.
Williamsville, Ill.
Vouchers: R. D. Hatch and L. R. Bain.

ELDER, JOHN C., D.V.M.
Box 107, Bement, Ill.
Vouchers: L. R. Bain and R. D. Hatch.
GRAHAM, ALLAN L., D.V.M.
Ursa, Ill.
Vouchers: L. R. Bain and H. Jr. Hardenbrook.
HALL, RALPH F., D.V.M.
2920 Harrison St., Davenport, Iowa.
Vouchers: C. C. Morrill and L. E. Boley.
McQUEEN, RALPH D., D.V.M.
McLean, Ill.
Vouchers: L. R. Bain and R. D. Hatch.
MERRICK, JOHN W., D.V.M.
4109 Elm St., Brookfield, Ill.
Vouchers: L. R. Bain and R. D. Hatch.
ZUSCHLAG, WALTER E., D.V.M.
5817 S. Troy St., Chicago, Ill.
Vouchers: L. R. Bain and A. G. Schiller.

Iowa State College

ASHBAUGH, REUBEN E., D.V.M.
Wall Lake, Iowa.
Vouchers: F. K. Ramsey and I. A. Merchant.
BALL, ROGER A., D.V.M.
R. R. 1, Eldora, Iowa.
Vouchers: E. A. Benbrook and I. A. Merchant.
BARRINGTON, GLEN E., D.V.M.
Alexis, Ill.
Vouchers: O. W. Whitcomb and I. A. Merchant.
BAYLES, HOWARD E., D.V.M.
4627 W. 87th Place, Oak Lawn, Ill.
Vouchers: C. H. Covault and I. A. Merchant.
BERAN, GEORGE W., D.V.M.
Riceville, Iowa.
Vouchers: D. L. Baker and I. A. Merchant.
BOTTORFF, DARYL D., D.V.M.
Rt. 4, Webster City, Iowa.
Vouchers: F. K. Ramsey and I. A. Merchant.
BROCKSMITH, PAUL E., D.V.M.
Bicknell, Ind.
Vouchers: E. C. Jensen and I. A. Merchant.
BUSH, JOHN A., D.V.M.
304 S. 27th St., Lafayette, Ind.
Vouchers: B. W. Kingrey and O. W. Whitcomb.
COX, THEODORE X., JR., D.V.M.
Armour, So. Dak.
Vouchers: F. K. Ramsey and I. A. Merchant.
COYNE, JOHN J., D.V.M.
Traer, Iowa.
Vouchers: D. L. Baker and I. A. Merchant.
DeWITT, ROSS C., D.V.M.
Milford, Iowa.
Vouchers: O. W. Whitcomb and I. A. Merchant.
DICKINSON, CHARLES S., D.V.M.
Elburn, Ill.
Vouchers: E. A. Hewitt and I. A. Merchant.
FABER, WAYNE H., D.V.M.
26 2nd St., N. W., Lemars, Iowa.
Vouchers: E. A. Hewitt and I. A. Merchant.
FRANCIS, JAMES D., D.V.M.
Rt. 3, Davenport, Iowa.
Vouchers: O. W. Whitcomb and I. A. Merchant.
GLOTFELTY, ROBERT W., D.V.M.
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University of Missouri

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BAKER, HERMAN C., D.V.M., Bogard, Mo.

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University of Minnesota*

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BRENSIKE, DANIEL R., D.V.M., Rosendale, Wis.
BROWN, CHARLES W., D.V.M., 728 4th St., Granite Falls, Minn.
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CURTIN, TERRENCE M., D.V.M., Emery, S. Dak.
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HANSON, RODNEY C., D.V.M., Winthrop, Minn.
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KANSANBACK, LYLE, D.V.M., Slayton, Minn.
KARNIS, EUGENE K., D.V.M., Morris, Minn.
KLINGSPORN, ALBERT L., D.V.M., R. R. 2, Ellsworth, Wis.
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LUEDKE, ALBERT J., D.V.M., Veterinary Science Department, Pennsylvania State University, State College, Pa.
MANTHEI, DONALD O., D.V.M., Loretto, Minn.
MERRY, GORDON D., D.V.M., Sun Prairie, Wis.
MONSON, BENNITT E., D.V.M., Grand Meadow, Minn.
OINONEN, CHARLES A., D.V.M., Westby, Wis.
OLSON, HARRY R., D.V.M., University Village P-53, 29th and Como S.E., Minneapolis, Minn.
OTTESON, LLOYD L., D.V.M., Waunakee, Wis.
PAGE, ROBERT W., D.V.M., 417 Walnut, S. E., Minneapolis, Minn.
PATTERSON, LOWELL L., D.V.M., Arcadia, Wis.
PAULSON, CLIFTON A., D.V.M., Plainview, Minn.
PAWLISCH, RONALDEAN, D.V.M., Brodhead, Wis.
SCHLOTTHAUER, JOHN C., D.V.M., 508 15th Ave., S.W., Rochester, Minn.
SHREFFLER, CHARLES R., D.V.M., Main St., Garretson, S. Dak.
STOCK, LOREN L., D.V.M., Hoffman, Minn.
STROMBERG, MELVIN W., D.V.M., 2125-B Hoyt Ave., W., St. Paul, Minn.
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THAL, I. LELAND, D.V.M., 370 W. 6th St., Apt. 2, St. Paul, Minn.
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WENGER, DONALD R., D.V.M., Reading, Minn.
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WHITFORD, EUGENE L., D.V.M., Monona, Iowa.
WINANS, ROGER L., D.V.M., Shell Lake, Wis.
ZOSEL, JAMES R., D.V.M., 4736 17th Ave., S., Minneapolis, Minn.

Oklahoma A. & M. College*

ANTIN, IRA P., D.V.M., 1063 Gerard Ave., New York, N. Y.
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BARCE, ELMER A., D.V.M., Pine Tree Veterinary Hospital, Western Ave., MR No. 2, Augusta, Maine.
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Hendrix, James V. P., D.V.M., General Delivery, Stillwell, Okla.
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Holmes, Donald D., D.V.M., Mannford, Okla.
Keahey, Kenneth K., D.V.M., Physiology Department, Oklahoma A. & M., Stillwater, Okla.
Kenney, Robert M., D.V.M., 35 Oakland Ave., Cranston, R. I.
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Ontario Veterinary College

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Dugan, John M., D.V.M., Kelvington, Sask.
Fawcett, Charles D., D.V.M., Gen. Del., Regina, Sask.
Fowler, Donald M., D.V.M., Malta, Ill.
Fraser, Clarence M., D.V.M., Minnedosa, Man.
Gray, William C., D.V.M., 35 High St., Newton, N. J.
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Medway, William, D.V.M., Elie, Man.
Moneo, Daniel, D.V.M., Assiniboia, Sask.
Moore, Roy S., D.V.M., c/o Dr. R. H. Wright, Dundas, Ont.
MacDonald, Donald W., D.V.M., Daysland, Alta.
MacDonald, Kenneth R., D.V.M., Fairview, Alta.
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Texas A. & M. College

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Tuskegee Institute

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Washington State College*

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URIE, DAVID D., D.V.M., P.O. Box 173, Parowan, Utah.
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COMMENCEMENTS

University of California.—At the 1954 commencement exercises of the School of Veterinary Medicine, University of California, on June 16, the following 43 candidates were presented for the D.V.M. degree.

Richard M. Ashton
Harold R. Baker
Robert H. Baker
Patrick H. Baymiller
Robert L. Brewer
Gordon F. Burrows
Robert F. Carroll
Charles R. Clinkenbeard
Jerrold W. Cole
Bennie E. Dillon
Roy Dillon
Frank G. Enders
Anthony W. Feldmann
Clifford A. Frost
Jerry F. Garibaldi
Louis A. Hartjen
William H. K. Herron
Howell B. Hood
Eugene A. Johnson
George S. Knox
Arthur A. Leck
William L. Martin
George E. McDaniel, Jr.
Conrad E. McGlamery

Benjamin M. McWhinney
Holmes R. Mengle
Matthew L. Murdock
Howard W. Murray
Frank M. Patterson
Philip D. Plocher
Lawrence M. Proctor, Jr.
William L. Randol
Leo M. Rifkind
William F. Riggs
Robert R. Robinson
Gordon T. Simmons
Robert M. Stoufer
James P. Thomas, Jr.
John Tillema
Eugene W. Tobias
Charles B. Webster
Frank T. Wilken
Dean C. Young

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Colorado A. & M. College.—At the 1954 commencement exercises of the Colorado A. & M. College on June 11, the following 56 candidates were presented for the D.V.M. degree.

Jerry Lee Adcock
William D. Barber
Arthur C. Bement
Gene M. Bierhaus
Harold R. Blanc
Bob O. Bond
Wendell E. Brooksby
George M. Brown
William F. Burford
Folke W. Carlson
Jordan R. Dann
Earl O. Dickinson
Keith L. Doing
Roy Echeverria
Jack Ellis
Jack Finger
Glen Gausman
William R. Godden
Russell Green
John W. Hadley
Jack G. Harvey
Charles R. Hilbers
Merritt Hinshaw, Jr.
Grant C. Jensen
Merlin L. Kaeberle
Carl A. Keller
Douglas Laitinen
Hugh Leslie
Donald McLean
Woodrow W. Miller
Henry C. Neuswanger
John T. Oakes
Thomas F. Orchard
Charles Parvin
Marcus A. Piano
Duane N. Rice
Robert Rolofson
Marvin Saya
A. William Schramm
Clyde Shouse
Robert H. Singer
Donald J. Smylie
Robert D. Snyder
Jack Sohrbeck

Graduating Class, 1954, School of Veterinary Medicine, University of California

Top row (left to right)—Richard M. Ashton, Harold R. Baker, Robert H. Baker, Dean G. H. Hart, Patrick H. Baymiller, Robert L. Brewer, Gordon F. Burrows, Merrill A. Burt.
Second row—Robert E. Carroll, Charles R. Clinkenbeard, Jerrold W. Cole, Bennie E. Dillon, Roy Dillon, Neal J. Dow, Frank J. Enders, Anthony W. Feldmann, Norman S. Freed.
Third row—Clifford A. Frost, Jerry F. Garibaldi, Louis A. Hartjen, William H. K. Herron, Howell B. Hood, William H. Huntley, Jack E. Jocoy, Eugene A. Johnson, George S. Knox.
Fourth row—Arthur A. Leck, William L. Martin, George E. McDaniel, Conrad E. McGlamery, Benjamin M. McWhinney, Holmes R. Mengle, Matthew L. Murdock, Howard W. Murray, John W. Oliver.
Fifth row—Frank M. Patterson, Philip D. Plocher, Lawrence M. Proctor, William L. Randol, Leo M. Rifkind, William F. Riggs, Robert R. Robinson, Herman C. Schlingman, Alvin Shapiro.
Bottom row—Gordon T. Simmons, Eugene C. Story, Robert M. Stoufer, James J. Thomas, John Tillema, Eugene W. Tobias, Charles B. Webster, Frank T. Wilken, Dean C. Young.

George Staples
Forest Steves
Charles Stewart
Edward Swena
Roman Swiezy
Dee O. Taylor
Roy E. Teter
Myron Thompson
Charles F. Uecker
William W. Wall
Gordon Wallace
William A. Wolff

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University of Georgia.—At the 1954 commencement exercises of the School of Veterinary Medicine, University of Georgia, on June 7, the following 54 candidates were presented for the D.V.M. degree.

Coleman M. Absher
Wayland D. Andrews
Loys H. Austin
William L. Austin
William K. Barker, Jr.
Malcolm T. Barksdale, Jr.
David R. Berzon
Horace G. Blalock, Jr.
Richard E. Bradley
James C. Branch, Jr.
Jack E. Catlin
William B. Clark, Jr.
Thomas B. Clarkson, Jr.
Gerald K. Cordell
Walter W. Dickson
Luther J. Earwood
Walter R. Eskew, Jr.
Charles E. Faulkner

Graduating Class, 1954, School of Veterinary Medicine, Colorado A. & M. College

Thomas P. From
Gerald D. Gaines
Presson M. Givens
Hersel S. Harley
Stephen C. Hite
Joseph J. Johnson
James T. King
Donald R. Knauff
Donald E. Lee
Aris C. Lindsey, Jr.
Kenneth C. Loper
Ralph D. MacPherson, Jr.
William F. Meriwether
Millard V. Morrison
Spencer H. Morrison
Donald E. Mules
John H. Richardson
Bruce S. Riggs
Albert K. Robinson
James B. Rutledge, Jr.
McTyier Salter
Dorsey A. Sanders, Jr.
Charles C. Shackleton
Sol J. Simon
Stonewall J. Shirley, Jr.
Roy R. Smith
Jerry F. J. Stara
Lemuel B. Staton
Jesse G. Tippins
Roscoe E. Treadwell
Donald T. Walbert
John S. Walker
William G. Webb
Jack L. Williams
Robert G. Williams
Herbert N. Witt

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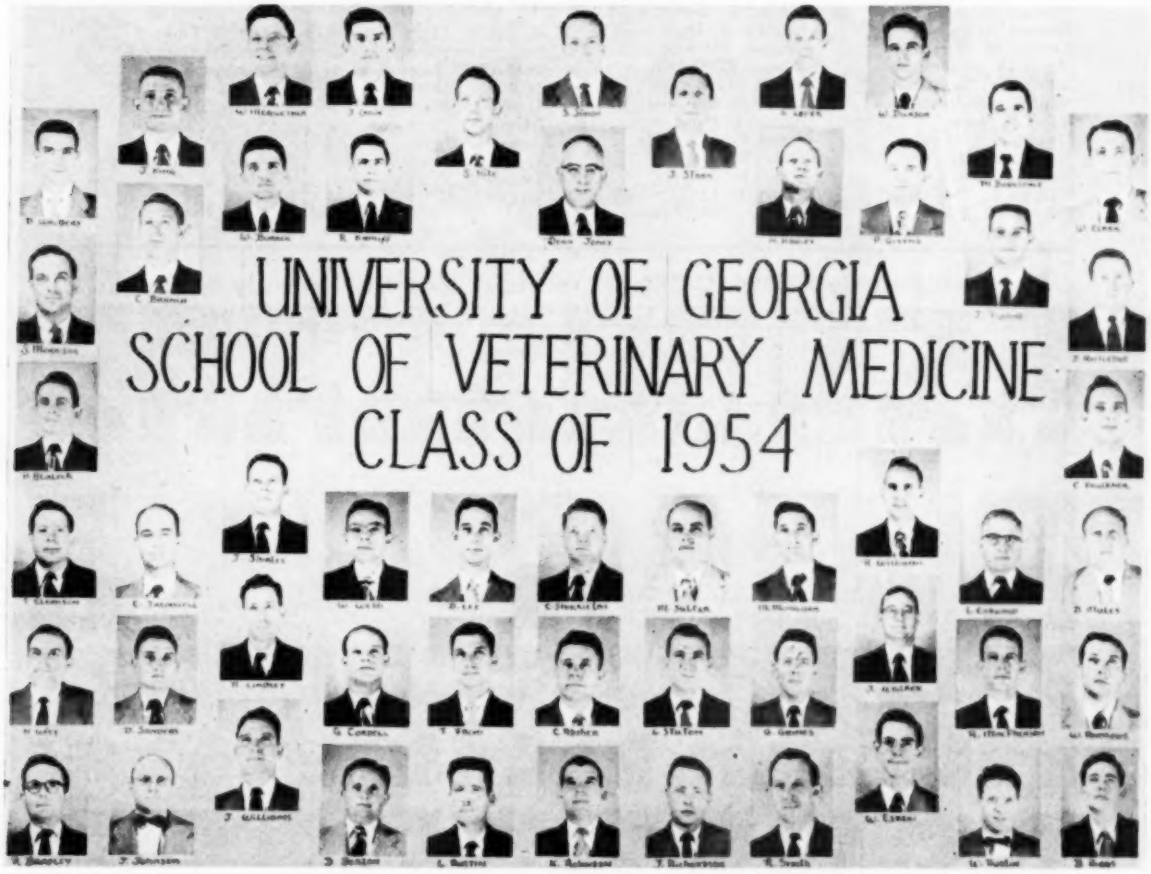
University of Illinois.—At the 1954 commencement exercises of the School of Veterinary Medicine, University of Illinois, on June 20, the following 33 candidates were presented for the D.V.M. degree.

Harold H. Bahe
Arthur A. Bottorff
Elwin E. Branz
Denzil E. Dees
John C. Elder
Walter L. Fehrenbacher
Thomas M. Folkerts
Frederick E. Fricke
Allan L. Graham
Thomas J. Gunhouse
Ralph F. Hall, Jr.
Harold J. Heffernan

Graduating Class, 1954, School of Veterinary Medicine, University of Georgia



Left column (top to bottom)—D. Walbert, S. Morrison, H. Blalock, T. Clarkson, N. Witt, R. Bradley.
Second column—J. Kink, C. Branch, E. Treadwell, D. Sanders, J. Johnson.
Third column—W. Meriwether, W. Barker, J. Shirley, A. Lindsey, J. Williams.
Fourth column—J. Catlin, R. Knauff, W. Webb, G. Cordell, D. Berzon.
Fifth column—S. Hite, D. Lee, T. From, L. Austin.
Sixth column—S. Simon, Dean Jones, C. Shackleton, C. Absher, K. Robinson.
Seventh column—J. Starr, M. Salter, L. Staton, J. Richardson.
Eighth column—K. Loper, H. Harley, M. Morrison, G. Gaines, R. Smith.
Ninth column—W. Dickson, P. Givens, R. Williams, J. Walker, W. Eskew.
Tenth column—M. Barksdale, J. Tippins, L. Earwood, R. MacPherson, W. Austin.
Last column—W. Clark, J. Rutledge, C. Faulkner, D. Mules, W. Andrews, B. Riggs.

Frederick B. Hembrough
Glenn G. Hintermeister
Robert C. Huff
John D. Lykins
Harold C. McCutchan
Ralph D. McQueen
John W. Merrick
James H. Nadler
Walter Nehrkorn
Louis F. Ohlendorf
Jesse Payne, Jr.
William Prusaczyk
Jewell D. Schlapp
William L. Searls
Edward M. Shinn
Stanley R. Spesard
Donald R. Strombeck
Raol J. Taft
Edwin K. Wilkin
James G. Zabin
Walter E. Zuschlag

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Iowa State College.—At the 1954 commencement exercises of the School of Veterinary Medicine, Iowa State College, on June 11, the following 60 candidates were presented for the D.V.M. degree.

Reuben E. Ashbaugh
Roger A. Ball
Glen E. Barrington
Howard E. Bayles
Richard A. Benson
George W. Beran
Daryl D. Bottorff
Edwin W. Branaman
Paul E. Brocksmith
John A. Bush
Theodore Y. Cox
John J. Coyne
Ross C. DeWitt
Charles S. Dickinson
Wayne H. Faber
James W. Foster
James D. Francis
Granville H. Frye
Robert W. Glotfelty
Howard A. Haas
John C. Haromy
Edward L. Henrick
Robert M. Hensley
James R. Howard
Norris J. Hyde
James C. Jensen, Jr.
Gene W. Jordahl
Merle H. Lang
Henry B. Lyons
Donald J. McKenna
Kenneth D. McMartin
Jacob A. D. Martin
George W. Meyerholz
Allen Y. Miyahara
Edward J. Murphy
Robert J. Nelson
Howard C. Nicoll
Raymond G. Pahle
Horace A. Peterson
Dexter D. Philson
Marshall O. Pitcher
William O. Reece
Stanley C. Romans
William T. Rugger
Leo M. Schmall
Daniel J. Shey
John E. Smith
Conrad S. Steiner
Lee G. Sutherland
Leon J. Sutton
Gordon G. Thomas
Kenneth L. Turner
Vincent A. Votteler
Robert N. Warner
Barrie D. Watson
Dale K. Welbourn
John L. Wilson
James E. Young
Harry W. Yoder, Jr.
Fred C. Zimmerman

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Kansas State College.—At the 1954 commencement exercises of the School of Veterinary Medicine, Kansas State College, on May 23, the following 58 candidates were presented for the D.V.M. degree.

Robert W. Allen
Leonard A. Anderson
Howard F. Bennett
Harry F. Blanchard
Dewey L. Boydston
Thomas L. Branigan
Ernest E. Bruce
Leslie B. Crawford
Dennis E. Cumro
Louis B. Cumro
Dean A. Darling
Raymond E. Dill
Charles M. Early
Charles E. Fuller
Alfred O. Gigstad
Winston K. Goering
Edward M. Gofreed
Robert U. Gross

(Continued on page 184)

Graduating Class, 1954, College of Veterinary Medicine, University of Illinois

Top row (left to right)—L. F. Ohlendorf, J. C. Elder, E. K. Wilkin, R. D. McQueen, J. D. Lykins, J. W. Merrick, H. J. Heffernan, G. G. Hintermeister, S. R. Spesard, H. H. Bahe.

Second row—T. J. Gunhouse, Dean R. Graham, W. L. Fehrenbacher.

Third row—W. Prusaczyk, W. E. Zuschlag, T. M. Folkerts, J. D. Schlapp, J. Payne, R. C. Huff, R. F. Hall, E. E. Branz, W. Nehrkorn, W. L. Searls.

Bottom row—E. M. Shinn, J. G. Zabin, D. E. Dees, J. H. Nadler, D. R. Strombeck, H. C. McCutchan, A. L. Graham, A. A. Bottorff, F. B. Hembrough, R. J. Taft.

Graduating Class, 1954, School of Veterinary Medicine

Iowa State College

1954

Top row (left to right)—R. E. Ashbaugh, R. A. Ball, G. E. Barrington, R. A. Benson, G. W. Beran, D. D. Bottorff.
Second row—E. W. Branaman, P. E. Brocksmith, J. A. Bush, T. X. Cox, J. J. Coyne, R. C. DeWitt, C. S. Dickinson, W. H. Faber, J. W. Foster, J. D. Francis.
Third row—G. H. Frye, R. W. Glotfelty, H. A. Haas, J. C. Haromy, E. I. Henrich, R. M. Hensley, J. R. Howard, N. J. Hyde, J. C. Jensen, Jr., M. H. Lang, H. B. Lyons, D. J. McKenna, K. D. McMartin, J. A. D. Martin.
Fourth row—G. W. Meyerholz, A. Y. Miyahara, E. J. Murphy, R. J. Nelson, H. C. Nicoll, R. G. Pahle, H. A. Petersen, D. D. Philson, M. O. Pitcher, W. O. Reece, S. D. Romans, Jr., W. T. Rugger, L. M. Schmall, D. J. Shey.
Bottom row—J. E. Smith, C. S. Steiner, L. G. Sutherland, L. J. Sutton, G. G. Thomas, K. L. Turner, V. A. Votteler, R. N. Warner, B. D. Watson, D. K. Welbourn, J. L. Wilson, H. W. Yoder, Jr., J. E. Young, and F. G. Zimmerman.

(Continued from page 182)

Charles E. Haines
Harold W. Heiser, Jr.
Robert G. Heiser
William W. Herberg
Charles E. Herren
Peter Johnson, Jr.
Francis E. Kaiser
James H. Kuhlmann
Patrick G. Leonard
Glenn L. Leslie
Norman A. Luckeroth
Joseph M. Magrath
Charles H. Maloney
Clial D. McDonald
Maurice C. Morrissette
Donald L. Nickerson
Frank A. O'Donnell
Lloyd E. Orsborn
Charles H. Paul
John T. Peterson
Lloyd W. Pottroff
Reed R. Rumsey
F. Charles Schnitzler
Jack W. Schrader
Vaughn A. Seaton
Otto S. Shill, Jr.
Donald G. Shuman
Burrell D. Spahr
J. A. Sprowls
Albert C. Strafuss
Soronda N. Swann
John J. Swanson, Jr.
Charles B. Swenson
Eldon M. Todd
John N. Tuttle, Jr.
Joseph W. Wagner
Gordon B. Wasson
Joseph S. Wheatley
Earl C. Wood
Melvin L. Worthington

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University of Minnesota.—At the 1954 commencement exercises of the College of Veterinary Medicine, University of Minnesota, the

(Continued on page 186)

Graduating Class, 1954, School of Veterinary Medicine, Kansas State College

Top row—C. E. Haines, R. R. Rumsey, R. E. Dill, V. A. Seaton, D. E. Cumro, O. S. Shill, C. E. Herren, C. D. McDonald, A. O. Gigstad, C. M. Early.

Second row—M. C. Morrissette, J. S. Wheatley, G. B. Wasson, A. C. Strafuss.

Third row—P. G. Leonard, R. W. Allen, L. A. Anderson, R. U. Gross, D. L. Nickerson, S. N. Swann, M. L. Worthington, J. J. Swanson, E. M. Gofreed, W. W. Herberg, R. G. Heiser.

Fourth row—J. T. Peterson, Peter Johnson, L. E. Orsborn, F. A. O'Donnell, E. M. Todd, L. W. Pottroff, E. E. Bruce, T. L. Branigan, J. W. Schrader, J. M. Magrath, H. W. Heiser.

Fifth row—J. A. Sprowls, W. K. Goering, F. E. Kaiser, C. E. Fuller, B. D. Spahr, F. C. Schnitzler, G. L. Leslie, D. G. Shuman, C. H. Paul, D. L. Boydston, D. A. Darling.

Bottom row—J. N. Tuttle, N. A. Luckeroth, J. H. Kuhlmann, L. B. Cumro, H. F. Blanchard, C. H. Maloney, C. B. Swenson, J. W. Wagner, H. F. Bennett, E. C. Wood, L. B. Crawford.

Graduating Class, 1954, College of Veterinary Medicine, University of Minnesota

Top row (left to right)—Orlin W. Bakke, Axel H. Bendickson, Walter A. Bonnett, Clyde L. Books, Charles T. Brandly, Daniel R. Brensike, Charles W. Brown, Delbert G. Carlson, William F. Cates, Terrence Curtin, Ronald Engel, Norman Frederickson, Harold H. Fuglsang.

Second row—Kenneth G. Gillette, Raymond L. Grefe, Rodney C. Hanson, Carl J. Harberts, Alfred C. Hartung, Paul J. Homme.

Third row—William A. Horne, Carl L. Johnson, Donald D. Johnson, Charles A. Oinonen, Dr. H. C. H. Kernkamp, Lyle V. Kansanback, Eugene K. Karnis, Albert L. Klingsporn.

Fourth row—George L. Koepke, Allen F. Larson, Albert J. Luedke, Donald O. Manthie, Gordon D. Merry, Bennitt E. Monson, Harry R. Olson, Lloyd L. Otteson, Robert W. Page, Lowell I. Patterson, Clifton A. Paulson, Ronaldean Pawlisch.

Bottom row—John C. Schlotthauer, Charles R. Shreffler, Charles E. Stevens, Loren L. Stock, Melvin W. Stromberg, Dan E. Suther, I. Leland Thal, Robert F. Walser, Donald R. Wenger, Daniel A. West, Eugene L. Whitford, Roger L. Winans, James R. Zosel.

(Continued from page 184)

following 51 candidates were presented for the D.V.M. degree.

Orlin W. Bakke
Axel H. Bendickson
Walter A. Bonnett
Clyde L. Books
Charles T. Brandly
Daniel R. Brensike
Charles W. Brown
Delbert G. Carlson
William F. Cates
Terrence Curtin
Ronald Engel
Norman Frederickson
Harold H. Fuglsang
Kenneth G. Gillette
Raymond L. Grefe
Rodney C. Hanson
Carl J. Harberts
Alfred C. Hartung
Paul J. Homme
William A. Horne
Carl L. Johnson
Donald D. Johnson
Lyle V. Kansanback
Eugene K. Karnis
Albert L. Klingsporn
George L. Koepke
Allen F. Larson
Albert J. Luedke

(Continued on page 188)

Graduating Class, 1954, College of Veterinary Medicine, Ohio State University

Top row (left to right)—Robert L. Burwell, William E. Covert, Paul E. Williams, Harry F. Bartels, Weaver M. Williamson, Dean S. H. Baker.

Second row—James T. Jantz, Alan P. Cragg, Paul M. Arnstein, Norris E. Boothe, Royce W. Smith, Robert S. Scherer, Robert Alexander, Victor von Tharp, Edward A. Weidenbener.

Third row—William C. Patterson, Jerome F. Fix, Layson T. Doty, John G. Butler, Albert W. Franzmann, Robert L. Boger, Alfred M. Bettman, Franklin A. Coy, John L. Shepherd, Raymond M. Cerniga.

Fourth row—John J. Pfost, Richard A. Kindinger, Ernest Kaszar, Earl E. Lindsay, Robert A. Hakola, Thomas Gigliotti, Jr., Raymond E. Houk, Harvey C. Hollis, George W. Hofmann, Forrest G. Ferris, Albert W. Gabel.

Fifth row—Richard L. Overpeck, George F. Nixon, Jr., Lloyd W. Prasuhn, Jack A. McGuire, Donald B. Martin, Charles J. Ogi, John H. Liggett, Matthew E. Legge, John Nehay, Robert T. Hance, Karl S. Grady, Jr.

Sixth row—Thomas F. Stanley, Paul E. Steffen, Herbert W. Salter, Jr., William J. Roenigk, Bruce H. Sharp, Gerald B. Reed, Allen N. Saum, Forrest A. Reed, Frederick P. Sattler, Russell C. Schlosser, Forrest H. Oliver.

Bottom row—Thomas B. Follis, Wayne C. Culbertson, James D. Slavik, James E. Tomasek, William L. Thomas, Don A. Weibel, Stanley E. Peterson, Ralph Slusher, Harold C. Spencer, Charles G. Warner, Gale D. Tarbill.

Graduating Class, 1954, School of Veterinary Medicine, A. & M. College of Texas

Top row (left to right)—E. B. Aman, G. Berger, E. D. Besch, J. A. Braden, V. L. Broussard, E. W. Brucks, Jr., H. M. Bruechner, G. R. Cadwalder.
Second row—P. T. Cardeilhac, N. P. Clarke, P. H. Cochran, H. K. Corum, R. D. Cress, R. E. Curbello, J. G. Fish, Jr., C. E. Francis, G. R. Fuller.
Third row—H. E. Gregory, C. D. Griffin, B. W. Henderson, E. H. Horres, R. A. Hull, T. Hyler, Jr., H. H. Jones, Jr., J. E. T. Laningham, C. L. Odom.
Fourth row—D. I. Ogden, B. Y. Parker, M. J. Phillips, R. E. Pigott, C. F. Price, R. H. Pruett, F. A. Ramsey, L. M. Reedy, J. C. W. Rhodes.
Bottom row—D. E. Scott, C. K. Smith, E. W. Smyka, L. N. Springer, R. W. Stewart, W. L. Tarver, J. R. Vernon, R. C. Williford.

(Continued from page 186)

Donald O. Manthie
Gordon D. Merry
Bennitt E. Monson
Charles A. Oinonen
Harry R. Olson
Lloyd L. Otteson
Robert W. Page
Lowell I. Patterson
Clifton A. Paulson
Ronaldean Pawlisch
John C. Schlotthauer
Charles R. Shreffler
Charles E. Stevens
Loren L. Stock
Melvin W. Stromberg
Dan E. Suther
I. Leland Thal
Robert F. Walser
Donald R. Wenger
Daniel A. West
Eugene L. Whitford
Roger L. Winans
James R. Zosel

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Ohio State University.—At the 1954 commencement exercises of the College of Veterinary Medicine, Ohio State University, on June 11, the following 70 candidates were presented for the D.V.M. degree.

Robert Alexander
Paul M. Arnstein
Dean S. H. Baker
Harry F. Bartels
Alfred M. Bettman
Robert L. Boger
Norris E. Boothe
Robert L. Burwell
John G. Butler
Raymond M. Cerniga
Richard W. Cook
William E. Covert
Franklin A. Coy
Alan P. Cragg
Wayne C. Culbertson
Layson T. Doty
Forrest G. Ferris
Jerome F. Fix
Thomas B. Follis
Albert W. Franzmann
Albert A. Gabel
Thomas Gigliotti, Jr.
Karl S. Grady, Jr.
Robert A. Hakola
Robert T. Hance
George W. Hofmann
Harvey G. Hollis
Raymond E. Houk
James T. Jantz
Ernest Kaszar
Richard A. Kindinger
Matthew E. Legge
John H. Liggett
Earl E. Lindsay, Jr.
Donald B. Martin
Jack A. McGuire
John Nehay
George F. Nixon, Jr.
Charles J. Ogi
Forrest H. Oliver
Richard L. Overpeck
William C. Patterson
Stanley E. Peterson
John J. Pfost
Lloyd W. Prasuhn
Forrest A. Reed
Gerald B. Reed
William J. Roenigk
Herbert W. Salter, Jr.
Fredrick P. Sattler
Allen N. Saum
Robert S. Scherer
Russell C. Schlosser
Bruce H. Sharp
John L. Shepherd
James D. Slavik
Ralph Slusher
Royce W. Smith
Harold C. Spencer
Thomas F. Stanley
Paul E. Steffen
Gale D. Tarbill
Victor Von Tharp
William L. Thomas
James E. Tomasek
Charles G. Warner, Jr.
Don A. Weibel
Edward A. Weidenbener
Paul E. Williams
Weaver M. Williamson

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A. & M. College of Texas.—At the 1954 commencement exercises of the School of Veterinary Medicine, A. & M. College of Texas, the following 44 candidates were presented for the D.V.M. degree.

Edward B. Aman
Gillett Berger
Everett D. Besch
Joe A. Braden
Vance L. Broussard
Ernest W. Brucks, Jr.
Herman M. Bruechner
George R. Cadwalder
Paul T. Cardeilhac
Neville P. Clarke
Phillip H. Cochran
Herbert K. Corum
Ronald D. Cress
Robert E. Curbello
James G. Fish, Jr.
Charles E. Francis
Gerald R. Fuller
Howard E. Gregory

Graduating Class, 1954, School of Veterinary Medicine, Tuskegee Institute

Carl D. Griffin
Billy W. Henderson
Ernest G. Horres
Richard A. Hull
Trotter Hyler, Jr.
Howard H. Jones, Jr.
James E. T. Laningham
Clyde L. Odom
Donald I. Ogden
Billy Y. Parker
Martin J. Phillips
Richard E. Pigott
Charlie F. Price
Robert H. Pruett
Frank A. Ramsey
Lloyd M. Reedy
J. C. W. Rhodes
Daniel E. Scott
Charles K. Smith
W. H. Smith
Edmund W. Smyka
Lewis N. Springer
R. W. Stewart
Wendell L. Tarver
Raymond C. Williford
James R. Vernon

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Tuskegee Institute.—At the 1954 commencement exercises of the School of Veterinary Medicine, Tuskegee Institute, on May 24, the following 11 candidates were presented for the D.V.M. degree.

Clifford O. Belfield, Jr.
Wendell O. Belfield
Frederick J. Burke
Rodney T. Gross
Maxwell R. Henry
Roland S. Jeffries
William A. Jones
Marshall King
Michael E. Thomas
Lanxter D. Webber
John H. White, Jr.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A. Agricultural Research Service are reported as of June 25, 1954.

NEW APPOINTMENTS

Robert W. Allen, Kansas City, Kan.
Leonard A. Anderson, Portland, Ore.
William L. Austin, Moultrie, Ga.
Thomas M. Baldwin, San Francisco, Calif.
Wendell O. Belfield, Portland, Ore.
David R. Berson, Chicago, Ill.
Adam Betsch, Knoxville, Tenn.
Henry Birne, Los Angeles, Calif.
Herman M. Bruechner, Denver, Colo.
Frederick J. Burke, St. Louis, Mo.
William D. Buzard, Kansas City, Kan.
William R. Child, Milwaukee, Wis.
George L. Clement, Wichita, Kan.
Charles E. Francis, Lincoln, Neb.
Gerald R. Fuller, Fort Worth, Texas.
Joseph E. Guilfoil, Kansas City, Kan.
John C. Haromy, Jacksonville, Fla.
Billy W. Henderson, Helena, Mont.
Roland S. Jeffries, Los Angeles, Calif.
William A. Jones, Ottumwa, Iowa.
Oskars E. Kadzejs, Spokane, Wash.
Stanley K. Kesperavivine, Chicago, Ill.
Edgars Kleinbergs, Seattle, Wash.
Janis Klekers, Omaha, Neb.
Albert L. Klingsporn, St. Paul, Minn.
Loris D. Lauener, Oklahoma City, Okla.
Clial D. McDonald, Salt Lake City, Utah.
George A. Mullen, Jr., Topeka, Kan.
Billy Y. Parker, Fort Worth, Texas.
Jesse Payne, Jr., Memphis, Tenn.
Ollie U. Poth, Fort Branch, Ind.
Frank A. Ramsey, Fort Worth, Texas.
William B. Redman, Sr., Omaha, Neb.
Robert J. Reigh, Little Rock, Ark.
Frank H. Reimers, Omaha, Neb.
Marvin L. Sobule, Denver, Colo.
Soronda N. Swann, Kansas City, Kan.
Alphonse Vileita, Newark, N. J.
Carl F. Wells, Omaha, Neb.
Frank E. Wesley, Omaha, Neb.
Robert L. Ziriax, Jr., Albuquerque, N. M.

CANCELLATION of Appointments

George L. Clement, Wichita, Kan.
George A. Knox, Nashville, Tenn.

DEATHS

James C. Barbee, Madison, Wis.
William L. Hatcher, Albuquerque, N. M.
William H. Mohler, Washington, D. C.
Frank L. Spillman, Kansas City, Kan.

MILITARY FURLOUGH

Jack W. Smartt, Salt Lake City, Utah.

RESTORATION FROM MILITARY FURLOUGH

Fred Storz, Kansas City, Kan.

RESIGNATIONS

Henry Birne, Los Angeles, Calif.
Romualdas V. Buivid, Cincinnati, Ohio.
Jack W. DeLany, South St. Joseph, Mo.
Ray E. Hughes, Denver, Colo.
Robert G. Jones, Denver, Colo.
Kenneth B. Middleton, Kansas City, Kan.
Norman R. Piersma, East Lansing, Mich.
William C. Smart, Reno, Nev.

RETIREMENTS

James C. Green, Little Rock, Ark.
Charles J. Hayward, Sioux City, Iowa.
Frederick Low, Bismarck, N. Dak.
Carl T. Loy, Dubuque, Iowa.
Ollie U. Poth, Fort Branch, Ind.
William R. Richards, Louisville, Ky.
Albert O. Ward, Indianapolis, Ind.

TRANSFERS

D. Warner Anderson, from Storm Lake, Iowa, to Waterloo, Iowa.
I. Paul Coulter, from Jackson, Miss., to Jacksonville, Fla.
Charles C. Curry, from Omaha, Neb., to Chicago, Ill.
John C. DeHoll, from Nashville, Tenn., to Indianapolis, Ind.
Donald E. DeTray, from Beltsville, Md., to Nairobi, Kenya, East Africa.
John A. Ellens, from Detroit, Mich., to Louisville, Ky.
Morse A. Gates, from South St. Paul, Minn., to Storm Lake, Iowa.
Luciano B. Herrera, from Mexico City, Mex., to Oklahoma City, Okla.
William S. Houk, from Davenport, Iowa, to Denver, Colo.
Robert L. Pyles, from Olympia, Wash., to Jefferson City, Mo
Walter C. Terrall, from Little Rock, Ark., to Boston, Mass.
Frank R. Thorndike, fom Chicago, Ill., to Sioux City, Iowa.
Isidore V. Weisberg, from St. Louis, Mo., to Los Angeles, Calif.
Millard M. Woods, from Waterloo, Iowa, to Portland, Ore.

AMONG THE STATES AND PROVINCES

California

Dr. Wilcox Appointed Livestock Inspector.—Dr. Floyd P. Wilcox (GWU '16) was appointed county livestock inspector by the Los Angeles County board of supervisors on April 28 to succeed the late Dr. C. E. Wicktor.

Dr. Wilcox entered the service of the County Health Department in 1927. Following a brief period with Borden's Milk Company in western New York, he accepted an appointment with the Bureau of Animal Industry in the Chicago Stockyards. In October, 1917, he was appointed deputy state veterinarian for the State of California, which office was later merged with other

departments to form the Department of Agriculture.

Dr. Wilcox has been active in many professional, public health, and other organizations, serving as president of the California State Veterinary Medical Association in 1949-1950

Dr. Floyd P. Wilcox

and president of the Southern California Veterinary Medical Association in 1925. He is now treasurer of this Association and a member of the executive committee.

He also served as secretary of the original California Association of Sanitarians and, in 1929, as president of the California Association of Dairy and Milk Sanitarians. He has been a member of the AVMA since 1917.

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San Diego County Association.—The San Diego County Veterinary Medical Association elected the following officers on May 25: Drs. W. J. Dedrick, president; L. O. Foelschow, vice-president; and E. R. Quortrup, secretary-treasurer.

The Association conducts a dinner-business meeting the fourth Tuesday of each month except July and August. Because the California State Association meeting is being held in June, the local association did not meet that month.

s/E. R. QUORTRUP, *Secretary.*

District of Columbia

Death of Dr. William M. Mohler.—Dr. William M. Mohler, 55, son of the late Dr. John R. Mohler, former chief of the Bureau of Animal Industry, and himself a BAI staff member for many years, died of a heart ailment on June 9, 1954, in the Washington Sanitarium.

Born in 1898, in Philadelphia, Dr. Mohler received his preliminary education in the public schools there and his D.V.M. degree from Indiana Veterinary College in 1923. Previously, he had been employed as a research assistant in the Bureau during World War I and was appointed as a veterinary bacteriologist shortly after graduation. He helped develop a serological test for bovine anaplasmosis and also worked on the eradication of dourine in horses. He was the author or co-author of several articles on animal diseases.

Dr. Mohler was active in veterinary circles in the District, serving as secretary and later as president of the District of Columbia Veterinary Medical Association, and was a member of the Board of Veterinary Medical Examiners. He joined the American Veterinary Medical Association in 1932.

Surviving are his widow, Mrs. Adele Herbert Mohler of 5508 Nebraska Ave., N.W., Washington; a daughter, Mrs. Charles B. Baish, Jr., of Los Angeles; a sister, Mrs. W. C. Carrol of Fort Bragg, N. Car., and a son, John R. Mohler, II, who graduated in veterinary medicine at the University of Pennsylvania last June.

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District Association.—The District of Columbia Veterinary Medical Association met on the evening of May 18 at the National Institutes of Health, Bethesda, Md. A tour was conducted through the general facilities of the new clinic building, x-ray department, and the animal production unit.

s/WILLIAM C. PATTERSON, *Secretary.*

Georgia

North Georgia Association.—New officers of the North Georgia Veterinary Medical Association are Drs. J. T. Mercer, Elberton, president; Taylor Bragg, Monroe, president-elect; and J. W. Greenway, Chamblee, secretary-treasurer.

s/J. W. GREENWAY, *Secretary.*

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Southeast Association.—The following officers have been elected to serve the Southeast Georgia Veterinary Medical Association for 1954: Drs. W. L. Moore, Metter, president; B. C. Merritt, Lyons, vice-president; and F. H. Case, Savannah, secretary-treasurer.

s/F. H. CASE, *Secretary.*

Illinois

Film on Brucellosis Eradication.—An interesting, home-produced film, "The Sangamon County Brucellosis Story," was given a "premiere" showing at a banquet at the Nicholas Hotel, Springfield, on June 4, 1954. This film is a commendable local talent production showing how a voluntary brucellosis eradication campaign is organized, publicized, and carried out by local veterinarians in cooperation with

the county, state, and federal officials. Dr. G. C. Richardson (MSC '40), federal veterinarian assigned to Sangamon County, served as the "director" in the production of this educational film.

About 60 persons attended the premiere banquet as the guest of Dr. W. B. Holmes, Springfield distributor of veterinary supplies. Dr. C. C. Hastings of Williamsville served as toastmaster.

Prior to the banquet, television station WICS-TV broadcast a symposium on bovine brucellosis with Drs. C. C. Morrill, University of Illinois, C. C. Hastings, Williamsville, G. C. Richardson, Springfield, and W. A. Aitken, editor-in-chief, AVMA publications, Chicago, taking part. This film was broadcast by the same station the following Sunday, June 6. It is to be made available for use wherever a brucellosis eradication program is undertaken.

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Cook County Annual Rabies Vaccination Program Announced.—The Cook County Board of Commissioners announced early in June the fees to be charged dog owners for the annual inoculation of dogs against rabies which is now required under the state's new control law. A fee of $4 was fixed by the board, of which $3 is to be paid deputized veterinarians for their services; 50 cents will go toward paying administrative costs (the program must be self-sustaining without tax subsidy), and 50 cents will be used for supplying special tags to be attached to the collars of inoculated dogs.

Dr. E. C. Khuen of Evanston has been named county rabies inspector at a salary of $14,000 and the county board also voted to deputize all veterinarians in the county—about 100—as assistants to give the annual inoculations.

Under the law, owners of dogs not confined or muzzled shall have their dogs vaccinated prior to June 1 each year; this applies to all members of the canine family 3 months or more of age, also to pet foxes and wolves. Violators will be subject to fines of from $25 to $100. The law gives the county inspector complete authority for rabies control in Chicago and suburban Cook County.

For the entire state, the new law became effective on June 1, 1954. However, because of the serious rabies outbreak earlier this year in Chicago and Cook County, the state department of agriculture made it effective, on an emergency basis, on February 4 for the County.

Indiana

Indiana-Illinois Association.—On June 11, the Indiana-Illinois Veterinary Medical Association met in Terre Haute. Those in attendance were shown through the Pfizer Laboratories and plant. Drs. H. E. Downing and G. E. Hawley, of Pfizer & Co., were hosts. Among the new members present were Drs. John F. and Robert W. Medlock, Bedford, Ind., identical twins who graduated from Michigan State College in June.

The following officers were re-elected to serve the Association for another year: Drs. Odell Archer, Terre Haute, president; H. F. Page, Washington, vice-president; and Roy H. Demotte, Odon, secretary-treasurer.

s/J. L. KIXMILLER, *Resident Secretary.*

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Ninth District Association.—On June 25, the Ninth District (Ind.) Veterinary Medical Association met at the Seymour Country Club in Seymour. **Dr. Joe W. Green,** state veterinarian, spoke on regulatory work and asked for the cooperation of practitioners in the control of infectious diseases.

During the business session, the following officers were elected: Drs. R. S. Boren, Greenwood, president; K. B. Brown, Brownstown, vice-president; and George Davis, Franklin, secretary-treasurer.

s/J. L. KIXMILLER, *Resident Secretary.*

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Northeastern Association.—On June 20, members of the Northeastern Veterinary Medical Association met at Hamilton Lake, Hamilton. At the business meeting, the following officers were elected: Drs. H. J. Walko, Bluffton, president; R. E. Allison, Decatur, vice-president; and E. V. Blume, Butler, secreary-treasurer.

After the meeting, members enjoyed swimming, shuffle board, and horseshoes.

s/J. L. KIXMILLER, *Resident Secretary.*

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Northwestern Association.—The Northwestern Indiana Veterinary Medical Association met in Monticello on June 24, 1954. The guest speaker was **Dr. W. R. Pritchard** of Purdue University. He spoke on the toxicity caused by certain plants and chemicals.

Dr. and Mrs. C. L. Lindborg were hosts.

s/J. L. KIXMILLER, *Resident Secretary.*

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Tenth District.—The Tenth District (Ind.) Veterinary Medical Association elected the following officers at their June 17 meeting in Cornersville: Drs. R. E. Miller, Richmond, president; F. O. Gossett, Greenfield, vice-president; and R. S. Ensign, New Castle, secretary-treasurer.

Dr. J. D. Salisbury, Indianapolis, epidemiologist for the Indiana State Board of Health, reported that psittacosis has been appearing in chickens and affecting some workers in poultry-processing plants.

Dr. and Mrs. W. C. Jackson and Dr. and Mrs. John R. Lair, Cornersville, were hosts for the group.

s/J. L. KIXMILLER, *Resident Secretary.*

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Wabash Valley Association.—At the June 16 meeting of the Wabash Valley Veterinary

Medical Association in Rochester, the following officers were elected: Drs. R. M. Hafner, Huntington, president; H. A. Stevens, North Manchester, vice-president; and P. C. Clinger, Rochester, secretary-treasurer.

After the short business session and a round-table discussion, members enjoyed boating, swimming, and dancing.

s/J. L. KIXMILLER, *Resident Secretary.*

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Board of Public Health Needs Veterinarian.—There is an opening in the Board of Public Health of the City of Fort Wayne, for a veterinarian to serve as chief, environmental health. The duties will include directing milk, meat, and food programs; assisting health commissioner in program planning, budget making, and public relations. The beginning salary is $6,000, plus allowances, liberal pension plan, vacation, and sick leave.

The person must be 35 years of age or under, have some experience in public health or related fields.

Interested persons should write as soon as possible to: Commissioner of Health, Board of Health, Third Floor, City Hall, Fort Wayne, Ind.

Iowa

Cedar Valley Association.—The newly elected officers of the Cedar Valley Veterinary Medical Association are Drs. J. A. McIntosh, La-Porte City, president; R. L. Winegarden, Waterloo, vice-president; and D. A. Buchanan, Grundy Center, secretary.

s/D. A. BUCHANAN, *Secretary.*

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College Gets New Diagnostic Laboratory.—A new $600,000 wing across the north side of the Iowa State College veterinary quadrangle has been approved. It will face the Stange Memorial Clinic and will house the Iowa veterinary diagnostic laboratory. This two-story building with full basement has been sorely needed for many years. The department staff of ten includes five veterinarians and in 1953 handled over 200,000 specimens.

Completion, which is expected in 1955, will relieve the overcrowded condition in the departments of pathology, hygiene, and anatomy.

Award to Dr. Carey.—The annual Chicago Alumni Association award for the veterinary alumnus of Iowa State College who has done most for "advancing human welfare" was presented, in 1954, to Dr. James C. Carey (ISC '19), general practitioner at West Liberty. His citation states that "working by the Golden Rule," his original thinking attracted nationwide notice and brought demands for him to "give expositions on how best to service this important field." Always active as a civic worker he is "held in highest esteem—both in and out of the profession."

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Dr. Bergman Wins Faculty Citation.—When Dr. Henry Dale Bergman (ISC '10), dean emeritus of the School of Veterinary Medicine, was awarded the Iowa State College Faculty Citation recently for his many, effective contributions to Iowa State College, he became the first recipient of both this and the Alumni Recognition Medal which he received in 1953. The citation was presented at the 1954 annual alumni banquet.

Kansas

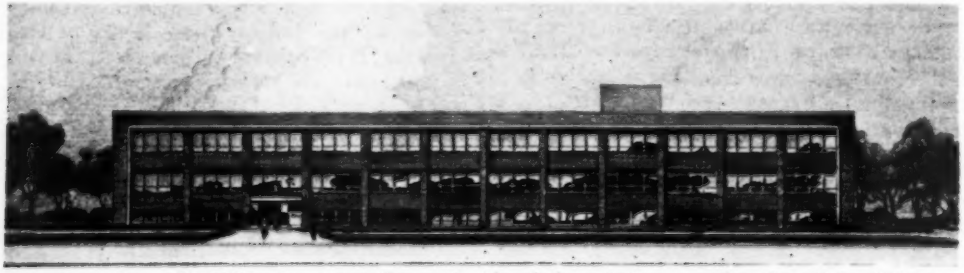
State Association.—The sixteenth annual conference for Kansas veterinarians was held June 4-5, 1954, at Kansas State College.

Featured speakers were **Drs. A. H. Quin,** Kansas City, Mo., president-elect of the AVMA; **Lester E. Hanson,** University of Minnesota, St. Paul; **G. T. Edds,** Fort Dodge Laboratories, Fort Dodge, Iowa; **Kenneth W. Smith,** Sioux City; **Frank B. Young,** Waukee, Iowa; and **F. W. Jordan,** Abilene, president of the Kansas Association. More than 20 members of the teaching staff at the College of Veterinary Medicine assisted with the conference and presented reports on research.

s/E. E. LEASURE, *Dean.*

Kentucky

New Canine Law.—The Kentucky General Assembly recently passed a new dog and rabies control bill. It provides for the licensing of all dogs of either sex at $1.50 each year, the appointment of a dog warden with police powers



Drawing of new $600,000 wing across the north side of the veterinary quadrangle, which will house the diagnostic laboratory.

for each county, and requires that all dogs be vaccinated for rabies, the cost not to exceed $1.50 when done at the mass clinics. Vaccinating is to be done by veterinarians where available. It also requires the reporting by the physician or others of all people bitten by dogs.—*Progressive Farmer, June, 1954.*

Massachusetts

Death of Dr. Homans.—The recent death of John Homans, M.D. (Harvard, 1903), surgeon emeritus of the Harvard Medical School and renowned blood vessel surgeon and author, brings to light the fact that he had a license to practice veterinary medicine of which he was very proud. He successfully passed the Massachusetts State Board examination in veterinary medicine in 1910.

Missouri

Kansas City Association.—On June 15, the Kansas City Veterinary Medical Association met in the Livestock Exchange Building to hear **Dr. Marvin Twiehaus** of Kansas State College discuss some of the current disease problems in the area. Dr. Twiehaus also showed some of the films he took while he was in practice in Missouri and of some of the cases brought into the clinic at Kansas State College.

s/J. C. Davis, *Secretary.*

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Northeastern Association.—The Northeast Missouri Veterinary Medical Association met in Macon on Thursday, April 15. Twenty-five veterinarians and their wives were present. **Dr. L. A. Rosner,** state veterinarian, discussed the brucellosis program and **Dr. A. D. Glover,** member of the Missouri Veterinary Board, discussed the new practice act.

s/A. H. Groth, *Resident Secretary.*

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Central Association.—The Central Missouri Veterinary Medical Association met at the Lake of Ozarks on Saturday, May 1. Some 20 veterinarians and their wives enjoyed an afternoon at the lake and dinner at Campbell's Lakeside Cafe. The program consisted of a discussion of the brucellosis program by **Dr. L. A. Rosner,** state veterinarian, and a round-table discussion of practice problems.

s/A. H. Groth, *Resident Secretary.*

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Southwestern Association.—The Southwest Missouri Veterinary Medical Association met at Joplin on Thursday, May 20. Some 50 veterinarians and their wives made it the best attended meeting held by this association. Veterinarians from southeastern Kansas and northeastern Oklahoma joined their Missouri colleagues.

The program included a discussion of the brucellosis program by **Dr. L. A. Rosner,** state veterinarian; small animal practice problems by **Dr. H. W. Howell,** School of Veterinary Medicine, University of Missouri; and large animal practice problems by **Dr. O. E. Ellis,** president of the Missouri Veterinary Medical Association, Paris.

s/A. H. Groth, *Resident Secretary.*

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Rabies in Missouri.—More than 150 cases of rabies were reported by practicing veterinarians in 11 southern and southeastern Missouri counties in the first three months of 1954. Vaccination clinics are held at various points in each county and the vaccinating is done by deputy state veterinarians at the owner's expense.—*Missouri V.M.A. Bull., April, 1954.*

New Jersey

State Association.—The Veterinary Medical Association of New Jersey held its summer meeting on June 23 at the Sunset Avenue Solarium in Asbury Park.

The following speakers participated in the program: **Drs. Arthur Bartenslager,** Stewartstown, Pa.; **Ryland Croshaw,** Columbus; **John Hamilton,** Clinton; **Charles Hoefle,** Wilton; **Raymond Huff,** Newton; **Mr. Paul James,** engineer, Agriculture Research Service, Animal Disease Eradication Branch, U.S.D.A.; and **Dr. Amos Stults,** Hopewell.

s/John R. McCoy, *Secretary.*

New York

New York State Veterinary College Honor Day Exercises.—The annual Honor Day exercises of New York State Veterinary College were held May 6, 1954, in Statler Hall. Dr. W. A. Hagan, dean of the New York State Veterinary College, presented the following awards:

The Borden Veterinary Scholarship Award ($300) to the member of the fourth year class who attained the highest scholastic record in all veterinary studies for the first three years: Robert W. Dellers.

The Horace K. White Prizes for the students whose academic records for the entire veterinary course are highest: Robert W. Dellers, first ($75); George E. Maurice, second ($25); Helen V. Coates and John E. Willson, honorable mention.

The Jane Miller Prizes for the best work in veterinary Physiology: Herbert Tanzer, first ($25); Alfred C. Steinhoff, Jr., second ($15); Robert B. Barrett and Herbert J. Rosenoff, honorable mention.

The Charles Gross Bondy Prizes for the best work in the courses in practical medicine and surgery of small animals: John E. Willson, first ($25); Clyde A. Corr, second ($15); Edward C. Melby, Jr., and Robert W. Dellers, honorable mention.

The Anne Besse Prizes for the best work in medicine and clinical diagnosis: Robert S. Stoll, first ($25); Edward C. Melby, Jr., second

($15); Clyde A. Corr, William T. Hume, and Robert F. Kahrs, honorable mention.

The James Gordon Bennett Prizes for the students who show the greatest humaneness in handling animals, with special reference to the use of anesthesia: Robert W. Dellers, first ($25); Robert E. Patterson, second ($15); Edward C. Melby, Jr., and Robert D. Miller, honorable mention.

The Mary Louise Moore Prize for the best work in bacteriology ($40): Robert W. Dellers.

The Alpha Psi Prize for the member of the graduating class who has shown by his scholarship, character, and breadth of interest that he is best equipped to advance the standards of veterinary science ($25 U. S. savings bond): Edward C. Melby, Jr.

The Sigma Iota Zeta Prize to the member of the graduating class who in the scope of his professional training has shown the most marked over-all improvement since his freshman year and has thereby demonstrated his sincere attitude of high purpose and achievement toward his profession ($25 U. S. savings bond): Edward W. Stewart.

The New York State Veterinary Medical Society Prizes for the best case reports presented for publication in *Veterinary News*, the organ of the Society: Edward W. Stewart, first ($25); John E. Willson, second ($15); and Clyde A. Corr, third ($10).

The Prize of the Women's Auxiliary of the American Veterinary Medical Association to the member of the fourth year class who is deemed to have best advanced the standing of the veterinary college on the campus by special contributions of an extracurricular nature ($25): Robert F. Kahrs.

The following awards were presented through the ROTC activities: The New York State Veterinary Medical Society Award for outstanding achievement in the Veterinary ROTC: Robert W. Dellers, first; Henri C. Marsh, second. The General Ralph Hospital Award: to the honor student in the graduating class ($25): Robert W. Dellers. The Colonel George S. Smith Award for interest and outstanding participation in the summer camp training ($30): Garth A. Murray. The Sons of the American Revolution Award for leadership, soldierly bearing, and excellence in the theoretical and practical work in the advanced ROTC course: James P. Childress.

s/W. A. HAGAN, *Dean.*

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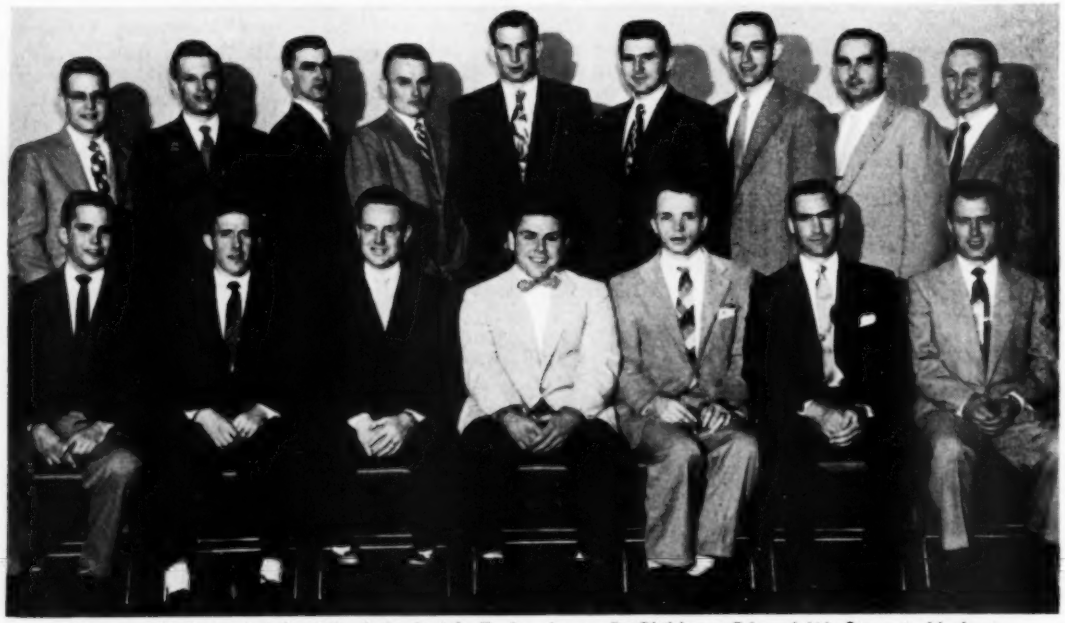
American Animal Hospital Association Meeting.—A total of 790 persons, of which 475 were veterinarians, from 38 states, Canada, Puerto Rico, and Cuba, registered at the Hotel Statler, New York City, on May 5-8 for the twenty-first annual meeting of the American Animal Hospital Association. A three-day program was highlighted by televised clinical demonstrations,

New York State Veterinary College Award Winners, 1954



First row (left to right)—Alfred C. Steinhoff, Jr., James P. Childress, Edward W. Stewart, Herbert Tanzer, George E. Maurice, Robert D. Miller, Clyde A. Corr.

Second row—Henri C. Marsh, Robert W. Dellers, Robert S. Stoll, John E. Willson, Robert F. Kahrs, Robert E. Patterson, Herbert J. Rosenoff, Robert B. Barrett, Edward C. Melby.

sponsored by Pitman-Moore Company and R.C.A.

The following officers were installed for 1954-1955: Drs. Charles W. Bower, Topeka, Kan., president; William F. Irwin, Tulsa, Okla., president-elect; James H. Yarborough, Miami, Fla., vice-president; and Arthur R. Theobald, Cincinnati, Ohio, treasurer.

Dr. Corwin is retiring president of the A.A.H.A. and Dr. Wayne H. Riser, Skokie, Ill., is executive secretary.

Twenty-two small animal hospitals were accepted into active membership at the meeting. A committee was appointed by the president to consider the establishment of a memorial fund for research in honor of the memory of the late Dr. Louis A. LaFond, Detroit, Mich., who until his death last February served for many years as the Association's hospital inspector.

A semiannual business meeting of the A.A.H.A. will be held following a luncheon at the Olympic Hotel, Seattle, Wash., on Monday, August 23, in conjunction with the AVMA meeting. The next annual meeting of the A.A.H.A. will be held at the Hotel Statler, Detroit, Mich., May 4-7, 1955.

Sanford M. Schor, a June graduate of Oklahoma A. & M. College, won the grand prize in the Moss Essay Contest, which is sponsored annually by the American Animal Hospital Association. Dr. Schor received an all-expenses-paid trip to the meeting and read his prize-winning essay before the convention. Reserve grand prize went to Jordan R. Dann, of Colorado A. & M. College. Dr. Dann has been accepted for internship at Angell Memorial Animal Hospital, Boston. The Moss Essay Contest was originated several years ago by Dr. Lloyd C. Moss, Colorado A. & M. College. The idea proved so worth-while that the A.A.H.A. decided to continue it as an annual project in the veterinary schools.

Other essay award winners were: University of California—Lawrence M. Proctor, Jr., Frank T. Wilkin, Charles B. Webster; Ontario Veterinary College—Donald D. Payne, William G. Whittick, R. B. Goskin; Kansas State College—J. A. Sprowls, Otto S. Shill, Charles H. Paul.

North Carolina

State Association.—The fifty-third annual meeting of the North Carolina State Veterinary Medical Association was held at the Hotel Robert E. Lee in Winston-Salem, on June 22-23, 1954.

Out-of-state convention speakers were **Drs. J. R. Dick,** Fort Dodge, Iowa; **J. H. Edwards,** Memphis, Tenn.; **W. O. Greene,** Nashville, Tenn.; **Lt. Col. N. G. MacEachern,** Maxwell Air Force Base, Ala.; and **Dr. F. H. Oberst,** Manhattan, Kan.

Members who addressed the convention were **Drs. N. G. Baird,** Lumberton; **M. H. Matthis,** Wilson; **J. G. Martin,** Boone; **J. P. Mauney,** Kings Mountain; **C. B. Randall,** Kinston; **C. M. Sellars,** Burlington; **A. W. Smith,** Farmville; **R. W. Smith,** Jacksonville; **R. T. Stapleton,** Fayetteville; **R. L. Williams,** Raleigh; and **C. W. Young,** Mocksville.

s/C. W. YOUNG, *Secretary.*

North Dakota

State Association.—The forty-ninth annual meeting of the North Dakota Veterinary Medical Association was held June 20-22, 1954, at the Gardner Hotel in Fargo.

The following speakers participated in the program: **Drs. J. T. E. Dinwoodie,** Union Stockyards, Interstate Inspection and Quarantine, Billings, Mont.; **L. M. Hutchings,** Purdue University, Lafayette, Ind.; **H. C. H. Kernkamp,** University of Minnesota, St. Paul; **A. H. Quin,** Kansas City, Mo., president-elect of the AVMA; **H. W. Herbison,** Fargo; **Don K. Christian,** Fargo; **Laurent Michaud,** Merck and Co., Rahway, N. J.; **T. O. Brandenburg,** Livestock Sanitary Board, Bismarck; **T. R. Myers,** veterinarian-in-charge, Disease Control and Eradication, Bismarck; **F. M. Bolin, I. A. Schipper,** and **Wayne Colberg,** North Dakota Agricultural College, Fargo; and **Stephen Richards,** North Dakota Game and Fish Department, Fargo.

s/D. F. EVELETH, *Secretary.*

Pennsylvania

Bucks-Montgomery Association.—The Bucks-Montgomery Veterinary Medical Association met at the Moose Home in Doylestown on June 9. **Dr. S. Sinha,** of the National Agricultural College, Bucks County, discussed the poultry diagnostic laboratory at the College, and Newcastle disease.

s/VINCENT W. RUTH, *Secretary.*

Texas

Conference for Veterinarians.—The seventh annual Texas conference for veterinarians was held June 3-4, 1954, at the Memorial Student Center, School of Veterinary Medicine, A. & M. College of Texas, College Station.

Guest speakers were **Drs. C. A. Brandly,** University of Wisconsin, Madison, Wis.; **L. M. Hutchings,** Purdue University, Lafayette, Ind.; **R. E. Ruggles,** Moline, Ill.; **Clarence Snyder** (M.D.), University of Texas Medical Branch, Galveston; and **V. L. Tharp,** Ohio State University, Columbus, Ohio.

Members of the Texas A. & M. faculty who participated in the program were **Dean W. W. Armistead, Drs. John P. Davis, A. A. Price, Harold E. Redmond, E. E. Roth,** and **Frank K. Wills.**

s/R. D. TURK, *Chairman.*

FOREIGN NEWS

Trinidad

British Caribbean Association Launched.—The first annual meeting of the British Caribbean Veterinary Medical Association was held at Trinidad May 24-28, 1954.

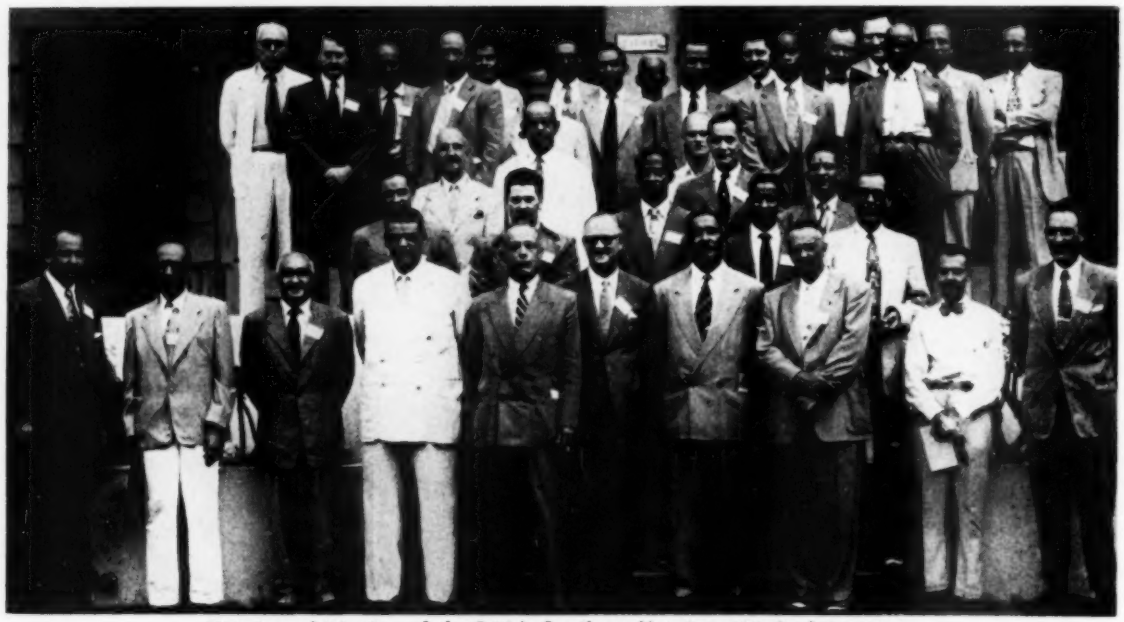
With **Dr. C. L. Hutson,** Trinidad, presiding, the Hon. **Victor Bryan,** Minister of Agriculture, Trinidad, gave the address of welcome, to which President-Elect **A. H. Quin** of the AVMA responded.

The program featured a resumé of Venezuelan-type encephalomyelitis (which has a mortality of over 90%) by **W. D. Downs,** M.D., Trinidad; a panel discussion of canine distemper; discussions of swine diseases and advances in veterinary therapeutics by **Dr. A. H. Quin;** foot-and-mouth disease in Central and South America by **Dr. E. H. Anderson,** F.A.O., Panama; respiratory diseases of poultry by **Dr. J. F. Crawley,** Toronto, Ont.; and general dairy practice by **Dr. P. M. Hinze,** Seattle, Wash. In a symposium on paralytic rabies, **J. L. Pawan,** M.D., Trinidad, authority on vampire bat rabies, brought out the fact that 49 human deaths from this disease have been reported in Trinidad alone. It is a grave livestock problem from Argentina to the border of Texas. Over 800,000 cattle in Mexico have been successfully vaccinated with a single 5-cc. dose of chicken embryo rabies vaccine.

A two-day large and small animal clinic was held at the Centino Experiment Station, with the following participants: **Drs. Eric Pallister,** Ottawa, Ont.; **P. M. Hinze,** Seattle, Wash.; **B. L. Thomas,** Antigua, B.W.I.; and **Stephen Bennett, W. P. Unsworth,** and **F. O. Gonzalez,** all of Trinidad. This new Association is welcomed to the ranks of veterinary associations of the Western Hemisphere.

Peru

New Officers of Peruvian Association Elected.—The recent election of officers of the Peruvian Veterinary Association resulted in the re-election of Dr. Juan Figueroa I (OSU '44) as president. The other officers are: Dr. Carlos Chavez, vice-president; Dr. Enrique Arvaiza,



First Annual Meeting of the British Carribean Veterinary Medical Association

Front row (left to right)—Dr. Stephen Bennett; J. L. Pawan, M.D.; Dr. Malaga Alba, Lima, Peru; Dr. Peat, M.D., Trinidad; Mr. Williams, Trinidad; Dr. C. L. Hutson; the Hon. Victor Bryan; Dr. A. H. Quin; Mr. A. M. Greenhall, curator, Trinidad Zoo; Dr. Eric Pallister.

Center row—Dr. McCoke, Jamaica; Dr. McClocklin, Trinidad; Dr. P. M. Hinze, Seattle, Wash.; Captain Mebevier, Drs. Louisy, Unsworth, Gonzales, Thomas, and Kirby, Trinidad; and Dr. E. D. Clawson, Miami, Fla.

Back row—Unidentified; Dr. E. H. Anderson, Dr. Diamond, British Guiana; Dr. Lervis; Dr. Macosier, Honduras; unidentified; Dr. Verbrooken, Dutch Aruba; Dr. Divo, Caracas, Venezuela; unidentified; Dr. Holman Williams, Secretary, B.C.V.M.A.; Dr. James Archibald, O.V.C., Guelph, Ont.; Dr. Blizzard, Trinidad; Dr. Reinich, Surinam, Dutch West Indies; Dr. Crawley; Dr. des Isles, Trinidad; Dr. Provents, Barbados; and Dr. W. D. Downs.

secretary; Dr. Emilio Matto, pro-secretary; Dr. Julio Vergara, treasurer, and Dr. Herman Basulto, pro-treasurer.

Dr. Figueroa is on the faculty of the School of Veterinary Medicine, San Marcos University, Lima; in addition to receiving his veterinary training at Ohio State University, he took post-graduate work in animal husbandry at the University of Wisconsin.

Philippine Islands

Dr. Refuerzo Returns from United States.—Dr. Pedro G. Refuerzo, chief of the Parasitic Diseases Division, Bureau of Animal Industry, Philippine Islands, and a member of the faculty of the College of Veterinary Medicine, University of Philippines, studied at the Alabama Polytechnic Institute, Auburn, Ala., for one quarter and for one quarter at the Michigan State College, School of Science and Arts, Department of Bacteriology and Public Health, under the 1953 Foreign Operations Administration Technical Assistance Program of the United States Government. He left the United States on June 27 to return to the Philippine Islands.

BIRTHS

Dr. (TEX '53) and Mrs. Guy T. Moore, Jr., Riverdale, Md., announce the birth of a son, Guy T., III, on April 15, 1954.

VETERINARY MILITARY SERVICE

The eighty-fifth class of veterinary officers completed (March 29, 1954) the course at the Army Medical Service Meat and Dairy Hygiene School in Chicago. The class visited AVMA headquarters on June 8 and heard talks on the work of the Association.

Front row (left to right)—Capt. John A. Postle, adjutant; Major Glenn A. Washburn, instructor; Capt. Elmer L. Robinson, instructor; Major Thomas A. S. Hays, instructor; Col. Philip R. Carter, commandant; Lt. Col. George D. Batcheldor, director; Major Edward P. Hornickel, instructor; Capt. William R. Strieber, instructor.

Second row—Second Lt. Carl D. Cason, Jr.; First Lt. Alexander Kardoulis; Second Lt. Franklin W. Rapp; First Lt. Roger W. Baker; First Lt. Carl E. Jacobsen; Major Raymond C. McPeek; Capt. Garth Corrie.

Third row—Capt. Charles T. Singletary; Second Lt. Glenn A. Severin; Second Lt. LeRoy W. Thom; Major Fred E. Castro; Capt. Warren E. Collins; Second Lt. Rex M. Maddox; First Lt. Edgar H. Eckermann.

Fourth row—First Lt. Donald F. Lucas; Second Lt. LeRoy O. Rasmussen; Second Lt. Warren L. VerPloeg; Second Lt. William M. Kortum; Capt. Elmer R. Laiho; Second Lt. Richard D. Holder; Capt. Arthur R. Smith.

Dr. (ISC '42) and Mrs. L. J. Moore, Terril, Iowa, announce the birth of a daughter, Mary Teresa, on May 16, 1954.

Dr. (WSC '53) and Mrs. Richard D. Reid, Albany, Ore., announce the birth of a daughter, Nelly Christiana, on May 28, 1954.

Dr. (MSC '47) and Mrs. John H. Wright, Minneapolis, Minn., announce the birth of a daughter, Lucy Anna, on May 31, 1954.

Dr. (MSC '50) and Mrs. R. M. Phillips, Flint, Mich., announce the birth of a daughter, Jill Martha, on June 2, 1954.

Dr. (OSU '45) and Mrs. P. B. Johnston, Madeira, Ohio, announce the birth of a son, Stephen Henry, on June 4, 1954.

DEATHS

★**Joseph T. Alston** (CVC '11), 71, Tupelo, Miss., died May 1, 1954. Dr. Alston, a general practitioner, was a member of the Mississippi Veterinary Medical Association and of the AVMA.

John Bacon (COR '26), Rego Park, N. Y., died of a heart attack on March 8, 1954. Dr. Bacon had been associated with the American Society for the Prevention of Cruelty to Animals and with the Ellin Prince Speyer Hospital for Animals.

Edwin F. Boehme (OSU '12), 63, Amelia, Ohio, died Jan. 10, 1954. Dr. Boehme had been employed by the State of Ohio in brucellosis control and eradication.

★**Gilbert E. Botkin** (IND '12), 65, Marion, Ind., died June 21, 1954. Dr. Botkin practiced in Mooreland, Ind., until 1927, when he opened his practice in Marion. He served this community until 1944 when he was appointed state veterinarian. In 1948, Dr. Botkin resumed his practice in Michigan City, Ind. He retired in 1951. He was a member of the Indiana Veterinary Medical Association and of the AVMA.

Dr. Botkin is survived by his widow, three sons, and five grandchildren.

★**M. Verne Burgett** (KCV '11), 67, Griffith, Ind., died June 7, 1954. Dr. Burgett was a member of the East Chicago Masonic Lodge, the East Chicago Odd Fellows Lodge, Indiana Veterinary Medical Association, and the AVMA. He is survived by his widow, son, and daughter.

★**William Cain** (USC '21), 69, New Orleans, La., died May 22, 1954. Dr. Cain was a member of the Louisiana Veterinary Medical Association and of the AVMA.

★**Elmer N. Davis** (KCV '17), 62, Altadena, Calif., died Dec. 23, 1953. Dr. Davis, who served in the Veterinary Corps during both world wars, was employed by the U. S. Bureau of Animal Industry from 1926 until 1942. After his retirement from the Veterinary Corps in 1944, he worked with the Kansas Livestock Sanitary Commission for awhile and then again entered the service of the BAI, serving until his retirement in 1953. Dr. Davis was a member of the AVMA. He is survived by his widow.

★**Charles E. Fievet** (API '44), 33, Swainsboro, Ga., died June 3, 1954, as the result of an automobile-train collision. Dr. Fievet was a member of the Georgia Veterinary Medical Association and of the AVMA.

★**Harry H. Glenn** (CVC '02), 78, Oklahoma City, Okla., died May 25, 1954. Dr. Glenn retired from BAI service in 1937. He was a resident of Oklahoma City for more than fifty years. He is survived by his widow.

★**Wayne A. Kelly** (COR '28), 48, Syracuse, N. Y., died April 27, 1954, of a heart attack. Dr. Kelly was a member of the American Veterinary Medical Association. He is survived by his widow, four sons, and a grandchild.

★**William Moore** (USC '11), 70, Cary, N. Car., former state veterinarian of North Carolina, and member of the AVMA Executive Board in 1935-1939, died on July 12, 1954, after a brief illness. A more extended obituary will appear in the September JOURNAL.

George C. Newberg (KCV '06), 68, Kansas City, Kan., died Sept. 15, 1953. Dr. Newberg spent his entire professional career in the service of the U. S. Bureau of Animal Industry. He retired in 1945.

W. H. Shaw (CVC '10), 72, Pawnee, Ill., died March 13, 1954. Dr. Shaw had served as a member of the Illinois State Board of Veterinary Examiners and as assistant state veterinarian. He was a member of the Illinois State Veterinary Medical Association but had resigned his AVMA membership in 1953.

Fred F. Smith (KCV '18), 65, Kansas City, Kan., died June 13, 1954. Dr. Smith, a veteran of World War I, had practiced in Kansas City for thirty-seven years. He is survived by his widow and a daughter.

★**Bertie L. Strohl** (IND '08), 77, Paris, Ill., died June 12, 1954, as the result of a heart attack. Dr. Strohl practiced in Oblong, Ill., until 1923, when he was appointed county veterinarian and moved to Paris, Ill. He later opened a general practice in Paris which he maintained until his death. Dr. Strohl was a member of the Illinois Veterinary Medical Association and of the AVMA.

★**Warren L. Tanner** (OSU '32), 50, Van Wert, Ohio, died April 17, 1954. Dr. Tanner, a general practitioner, was a member of the Ohio State Veterinary Medical Association and of the AVMA.

★**Rush U. Taylor** (KSC '23), 58, Oshkosh, Wis., died April 14, 1954. Dr. Taylor served in the Veterinary Corps of the U. S. Army. He was a member of the Wisconsin Veterinary Medical Association and of the AVMA. He is survived by his widow.

★Indicates members of the AVMA.

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POSSESSES BOTH ANTIALLERGIC AND ANTISPASMODIC ACTIVITY

Animals suffering from common skin irritations, dermatoses, and a variety of allergic conditions find welcome relief through the effective treatment afforded by Benadryl.

Benadryl Hydrochloride (diphenhydramine hydrochloride, Parke-Davis) is available in a variety of forms including:

Kapseals®, 50 mg. each; Capsules, 25 mg. each; Elixir, 10 mg. per teaspoonful; Steri-Vials®, 10 mg. per cc. for intravenous or intramuscular administration; and a cream containing 2% Benadryl Hydrochloride.

FOR THE RELIEF OF MANY SUMMER DISCOMFORTS

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CALAMINE AND BENADRYL HYDROCHLORIDE LOTION

Caladryl is a smooth, creamy lotion containing 1% Benadryl Hydrochloride in a specially prepared calamine base. It provides effective antihistaminic and antipruritic action. It relieves itching associated with urticaria, contact dermatitis, insect bites, and minor skin affections.

Caladryl is pleasant to use and is supplied in 6-ounce bottles for easy application. Also available as Caladryl Cream, containing 1% Benadryl Hydrochloride combined with calamine.

Professional literature available on request.

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Department of Veterinary Medicine

PARKE, DAVIS & COMPANY

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

Virginia Veterinary Medical Association. Annual meeting, Monticello Hotel, Charlottesville, Va., Aug. 8-10, 1954. A. J. Sipos, 1102 State Office Building, Richmond, Va., secretary.

American Veterinary Medical Association. Annual meeting. The Olympic Hotel, Seattle, Wash., Aug. 23-26, 1954: J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Canadian Veterinary Association and Ontario Veterinary Association. Annual meeting. Chateau Laurier Hotel, Ottawa, Ont., Aug. 30-Sept. 1, 1954. R. V. L. Walker, Animal Disease Research Institute, Hull, P.Q., chairman local arrangements.

Ontario Veterinary Association and Canadian Veterinary Association. Annual meeting. Chateau Laurier Hotel, Ottawa, Ont., Aug. 30-Sept. 1, 1954. R. V. L. Walker, Animal Disease Research Institute, Hull, P.Q., chairman, local arrangements.

Louisiana Veterinary Medical Association. Fall meeting. Lake Charles Country Club, Lake Charles, La., Sept. 8-9, 1954. R. B. Lank, Department of Veterinary Science, Louisiana State University, Baton Rouge, La., secretary.

New Mexico Veterinary Medical Association. Annual meeting. La Fonda Hotel, Santa Fe., N. M., Sept. 13-14, 1954. Joe M. Miller, Box 149, Alamogordo, N. M., secretary.

Northeast Mississippi Veterinary Medical Association. Annual clinic. Dr. W. L. Stroup's Clinic, Corinth, Miss., Tuesday, September 14, 1954. G. B. Bradshaw, Macon, Miss.

New York State Veterinary Medical Society. Annual meeting. Saranac Inn, Saranac, N. Y., Sept. 15-17, 1954. Joan S. Halat, Utica, N. Y., acting executive secretary.

Conference for Veterinarians. Alabama Polytechnic Institute, Auburn, Ala., Sept. 16-18, 1954. R. S. Sugg, dean, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala.

Northern Illinois Veterinary Medical Association. Fall meeting. Hotel Faust, Rockford, Ill., Sept. 22, 1954. J. W. Boller, Harvard, Ill., secretary.

Missouri, University of. Short course for veterinarians. School of Veterinary Medicine, University of Missouri, Columbia, Mo., Oct. 4-5 1954. Cecil Elder, chairman.

Wisconsin, University of. Postgraduate conference for veterinarians. University of Wisconsin, Madison, Wis., Oct. 7-8, 1954. C. A. Brandly, chairman, Department of Veterinary Science.

New England Veterinary Medical Association. Annual meeting, New Ocean House, Swampscott, Mass., Oct. 7-9, 1954. C. Lawrence Blakely, 484 Chestnut St., Needham, Mass.

Pennsylvania State Veterinary Medical Association. Annual meeting. Pocono Manor Inn, Pocono Manor, Pa., Oct. 13-15, 1954. R. C. Snyder, Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Eastern Iowa Veterinary Association. Annual meeting. Montrose Hotel, Cedar Rapids, Iowa, Oct. 14-15, 1954. Wayne H. Thompson, Earlville, Iowa, secretary.

South Dakota Veterinary Medical Association. Annual meeting. Cataract Hotel, Sioux Falls, S. Dak., Oct. 14-15, 1954. J. L. Noordsy, Marion, S. Dak., secretary.

Southern Veterinary Medical Association. Annual meeting. Geo. Vanderbilt and Battery Park Hotels, Asheville, N. Car., Oct. 18-20, 1954. H. L. Seelig, 111 Broadway, Asheville, N. Car., publicity chairman.

Department of Health, Education, and Welfare, in coöperation with the journal, *Antibiotics and Chemotherapy*. Symposium on Antibiotics. Washington, D. C., Oct. 20-22, 1954. Henry Welch, chairman.

Illinois, University of. Annual veterinary conference and short course. College of Veterinary Medicine, University of Illinois, Urbana, Ill., Oct. 21-22, 1954. L. E. Boley, chairman.

Mississippi Valley Veterinary Medical Association. Annual meeting. Pere Marquette Hotel, Peoria, Ill., Oct. 27-28, 1954. William L. Beer, 612 N. College Ave., Aledo, Ill., secretary.

West Virginia Veterinary Medical Association. Annual meeting. Hotel Morgan, Morgantown, W. Va., Oct. 31-Nov. 1, 1954. Elvin R. Coon, 346 Capitol Building, Charleston 5, W. Va., secretary.

(*Continued on p. 20*)

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WHITE HALL, ILLINOIS

(COMING MEETINGS—*continued from p.* 18)

New York State College of Agriculture at Cornell University. Annual nutrition conference for feed manufacturers. Statler Hotel, Buffalo, N. Y., Nov. 4-5, 1954. M. L. Scott, Rice Hall, Cornell University, Ithaca, N. Y., chairman.

U. S. Livestock Sanitary Association. Annual meeting. Hotel Fontenelle, Omaha, Neb., Nov. 10-12, 1954. R. A. Hendershott, 1 West State Street, Trenton 8, N. J., secretary.

Nebraska State Veterinary Medical Association. Annual meeting. Hotel Cornhusker, Lincoln, Neb., Dec. 1-3, 1954. W. T. Spencer, 1250 North 37th Street, Lincoln, Neb., secretary.

New York State Veterinary College. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, N. Y., Jan. 5-7, 1955. W. A. Hagan, dean.

Ohio State Veterinary Medical Association. Annual meeting. Deshler-Hilton Hotel, Columbus, Ohio, Jan. 5-7, 1955. William S. Konold, 50 East Broad Street, Columbus 15, Ohio, executive secretary.

Kansas Veterinary Medical Association. Annual convention. Town House Hotel, Kansas City, Kan., Jan. 6-8, 1955. K. Maynard Curts, 70 Central Ave., Kansas City 18, Kan., secretary.

Tennessee Veterinary Medical Association. Annual meeting. Knoxville, Tenn., Jan. 9-11, 1955. H. W. Hayes, 734 Broadway, North East, Knoxville, Tenn., secretary.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., Jan. 12-14, 1955. W. W. Garverick, Zionsville, Ind., secretary.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 18-20, 1955. F. B. Young, Waukee, Iowa, executive secretary.

American Animal Hospital Association. Annual meeting. Hotel Statler, Detroit, Mich., May 4-7, 1955. Wayne H. Riser, Skokie, Ill., executive secretary.

Foreign Meetings

Pan-African Days for Zootechnology. First meeting. Algiers, Algeria, Oct. 17-23, 1954. R. Camov, 3 Rue Péllissier, Algiers, Algeria, general secretary of the Societe Veterinaire de Zootechnie D'Algerie.

(*Continued on p.* 22)

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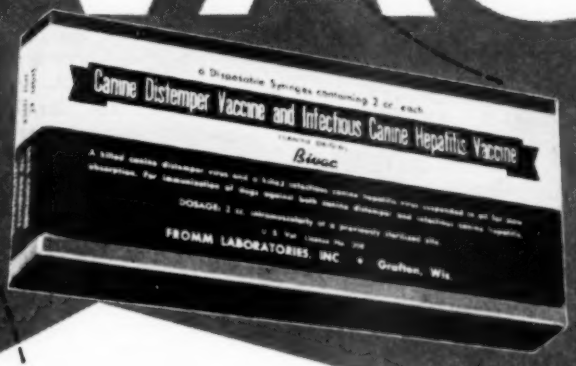

- A safe one-dose vaccine for the immunization of dogs against both canine distemper and infectious canine hepatitis.
- A killed canine distemper virus and a killed infectious canine hepatitis virus suspended in oil for slow absorption.
- Supplied in convenient 2 cc. disposable plastic syringes.
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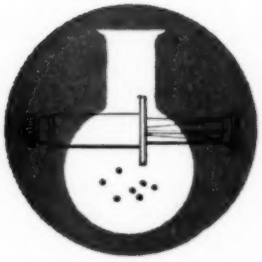

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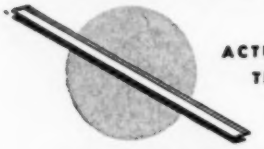

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MASTICS P&S

100,000 units penicillin
50,000 mcg. dihydrostreptomycin

MASTICS act fast because medication in high concentration is quickly dispersed throughout the quarter. Improvement often noted in 12 hours.

MASTICS contain no grease, no wax, no insoluble materials to remain in the udder retarding antibiotic action. MASTICS milk out completely—produce no residue on the strainer.

MASTICS are so effective, cows are returned to the herd more promptly with less loss of production.

LOW IN COST...HIGH IN POTENCY
MASTICS SAVE TIME, MONEY, MILK

WRITE FOR SAMPLES AND PRICES

The Martin Laboratories
West Chester, Penna.

(COMING MEETINGS—*continued from p. 20*)

Regularly Scheduled Meetings

Atlanta Veterinary Society, the first Tuesday of every month. C. L. Bromley, Jr., 1634 Northside Dr., Atlanta Ga., secretary.

Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison Streets, Baltimore, Md. Victor I. Sorgen, 133 Wiltshire Rd., Baltimore 21, Md., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. George W. Eberhart, El Cerrito, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month, except July and August, at Black's Tea Room, Waterloo, Iowa. D. A. Buchanan, Grundy Center, Iowa, secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Paul A. Carlson, 5556 Bobolink Lane, Fresno, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro. Dr. J. S. Ellis, 2450 Battleground Ave., Greensboro, N. Car., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Wayne H. Riser, 5335 Touhy Ave., Skokie, Ill., secretary.

Coastal Bend Veterinary Association (Texas), the second Wednesday of each month. J. E. Hoban, 4301 S. Port Ave., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. J. R. Rosdail, Pomeroy, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month—September through May (except January)—at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Roger W. Grundish, 4217 Mayfield Road, South Euclid 21, Ohio, secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. Robert Clemens, 23352 Orchard, Hayward, Calif., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. L. E. St. Clair, College of Veterinary Medicine, University of Illinois, Urbana, Ill., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month, time and place specified monthly. C. B. Randall, Kinston, N. Car., secretary.

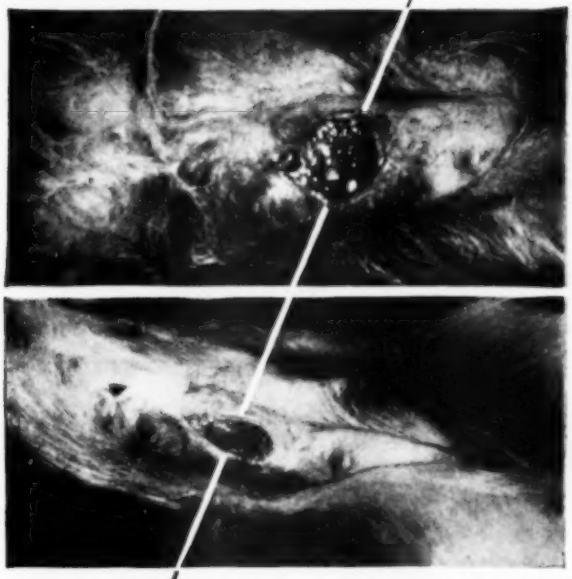
(*Continued on p. 26*)

For large and small animals

TRYPTAR *vet*

ARMOUR

for selective physiological debridement of necrotic tissue



TRYPTAR vet (Armour) may be used whenever debridement or removal of necrotic tissue is desired. It has been found to be effective in the following conditions:

- Osteomyelitis
- Surface ulcers
- Soft tissue abcesses
- Foot rot (bovine)
- Paranasal sinusitis
- Supperative bursitis (fistulous withers)
- Supperative arthritis
- Foot canker (equine)
- Purulent and gangrenous mastitis
- Pyometra and metritis
- Supperative otitis
- Infected compound fractures
- Infected amputation stumps

Tryptar rapidly dissolves fibrinous strands, surface coagula and clotted blood of necrotic lesions. The purulent exudate and necrotic tissue is also attacked. When the necrotic tissue has been penetrated, serum starts to flow from adjacent healthy tissue, floating away the digested debris. The exudate becomes serous and normal appearing leukocytes replace pathological leukocytes. With continued treatment exudation gradually ceases and fresh, healthy granulation tissue appears.

Package information: TRYPTAR vet (Armour) is supplied as a white crystalline powder in vials containing 200,000 Armour units. It is stable indefinitely in dry form at room temperature.

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MAXIMUM EFFECTIVENESS ALL-PURPOSE
INSECTICIDE CONCENTRATE

For effective action on dogs, cats, beef and milk cattle, calves, sheep, horses, etc.

Economical!

Dilute 2 oz. of PRALYINSECT to 1 gal. water.

PRALYINSECT
Available in pints and gallons through ethical distributors or direct.

EASY TO USE

kills and repels
SCREW WORMS, FLEECE WORMS AND BLOWFLIES

Safe! **Rids animals of ticks, fleas, lice, and certain other parasites including rhipicephalus sanguineus (brown dog tick.) Kills by contact through leg paralysis.**

Safe! **Will not injure pets when they lick their hair. Not injurious to wounds or skin abrasions.**

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Safe! **Contains no DDT or any of the chlorinated hydrocarbons.**

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more prolonged blood levels

improved therapeutic activity

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►The formula includes dextrose, beneficial in hypoglycemic complications.

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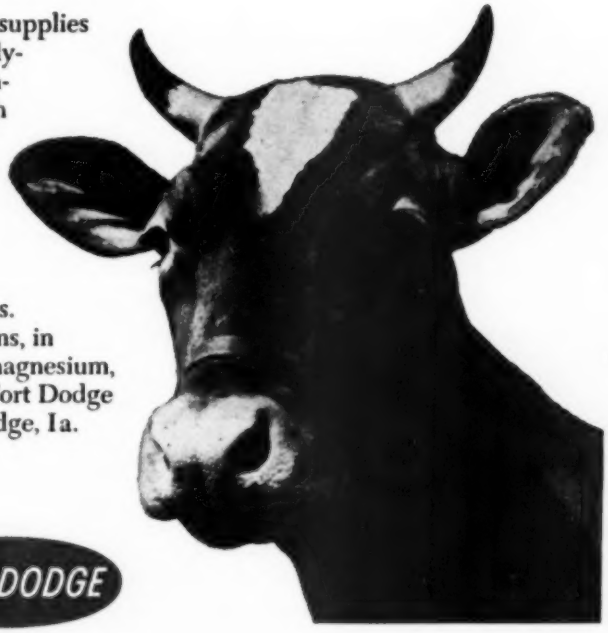

* Appleby, A.: Am.J.Vet.Res., 5:312-315 (1944).

FORT DODGE

(COMING MEETINGS—*continued from p. 22*)

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Florida, North-East Florida Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. J. O. Whiddon, 829 San Marco Blvd., Jacksonville, Fla.

Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Luther E. Fredrickson, Room 11, Municipal Courts Bldg., St. Louis, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Sunday evening of even-numbered months at the Jefferson Hotel, Peoria, Ill. S. M. McCully, Lacon, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. Dr. W. E. Bewley, P.O. Box "H", Crestwood, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at the Hotel Continental. J. A. Zacher, 3632 Main St., Kansas City, Mo., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month, at the Exchange Hall, Ninth Floor, Livestock Building, 1600 Genesee, Kansas City, Mo. J. C. Davis, 7332 Canterbury St., Kansas City 13, Mo., secretary.

Kern County Veterinary Medical Association, the first Thursday of each month. R. A. Stiern, 17 Niles St., Bakersfield, Calif., secretary.

Keystone Veterinary Medical Association, the Philadelphia County Medical Society Building, 301 S. 21st Street, Philadelphia, Pa., on the fourth Wednesday of each month. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Karl Mayer, 1531 Fourth Ave., Huntington, W. Va., secretary.

Maricopa County Veterinary Association, the second Tuesday of each month. Charles J. Prchal, 1722 East Almeria Road, Phoenix, Ariz., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from September through May, at the Academy of Medicine of Northern New

(*Continued on p. 28*)

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Lameness, strains and sprains . . .

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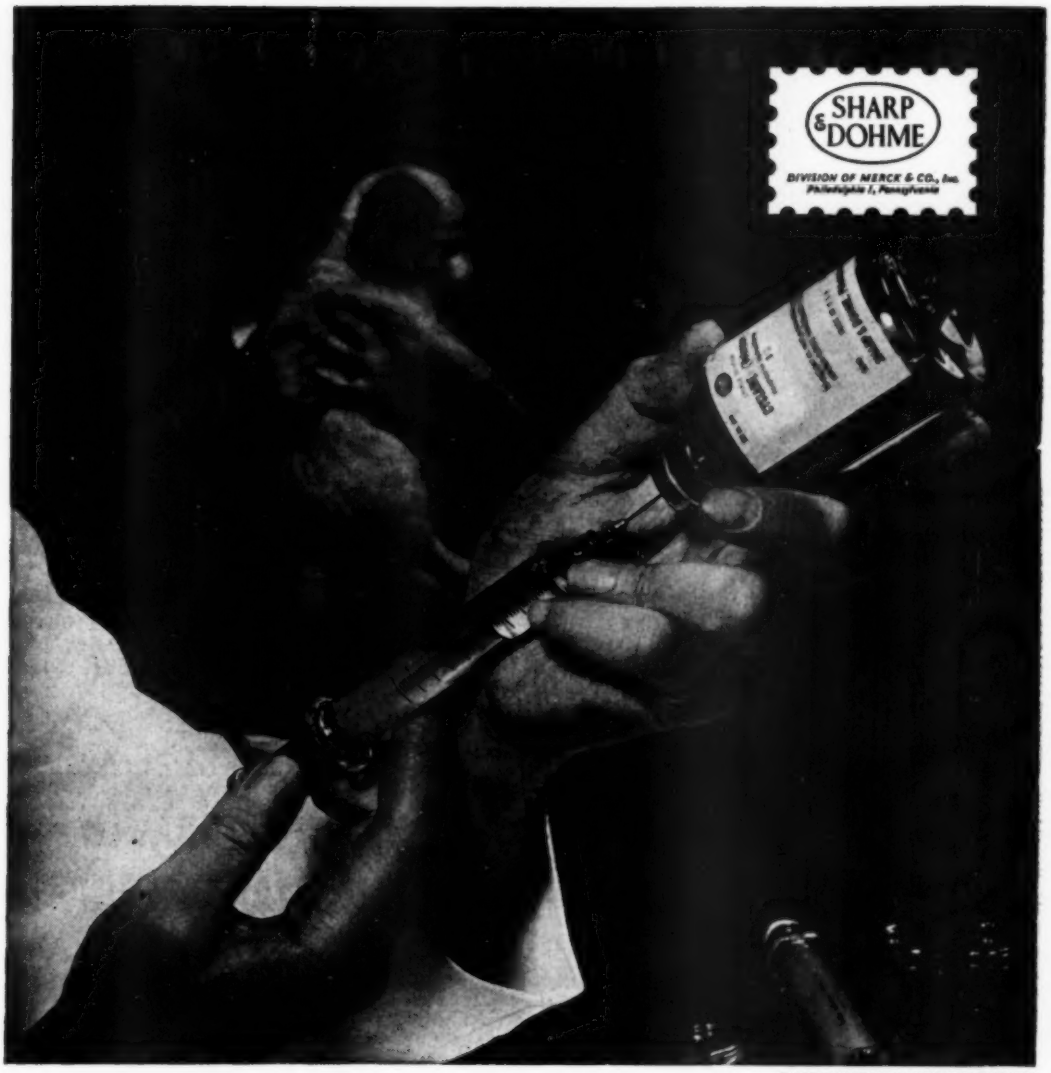

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Sharp & Dohme, Veterinary Department.

Reference: 1. Vet. Med. 48:269 (July) 1953.

Jersey, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Millburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month, at the Hotel LaSalle, South Bend, Ind. Paul W. Hough, 829 Bryan St., South Bend, Ind., secretary.

Michigan, Southeastern Veterinary Medical Association, the second Thursday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Road, Detroit 5, Mich., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. George McCollister, 2146 Broad St., San Luis Obispo, Calif., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month at the Hotel Admiral Simmes, Mobile, Ala. C. Eric Kennedy, Mobile, Ala., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 66 Marion Ave., Salinas, Calif., secretary.

New Castle County (Del.) Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Arthur P. Coogan, 2102 New Road, Wilmington 5, Del., secretary.

New York City, Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Northern Colorado Veterinary Medical Association, the second Monday of each month. William D. Carlson, P.O. Box 478, Fort Collins, Colo., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday evening from September through June, at the Casa Mana Restaurant, Cedar Lane, Teaneck, N. J. Robert R. Shomer, 1680 Teaneck Road, N. J., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Tom Hagan, Gen. Del., Escalon, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except August and July. R. J. Keller, 1701 N. Highland Drive, Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association,

(*Continued on p. 30*)

NEW IMPROVED RANCH RECORD VETERINARY SYRINGE

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The Ranch Syringe is made with finger bars or three rings.

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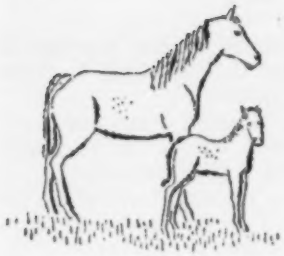

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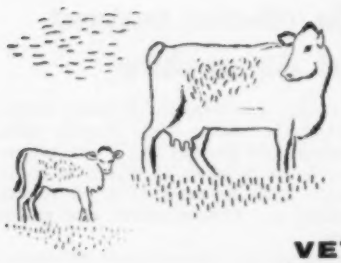

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In less severe cases, half the recommended dosage of VETROPHIN has been reported effective. And, because VETROPHIN is stable for 7 months after reconstitution, the remaining ½ vial does not have to be discarded.

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3.2% Vitamin B-12 and Antibiotic Feed Supplement, .650% Wheat Germ Oil, Vitamin A Acetate (50 Mg. per lb.), Cod Liver Oil with added Vitamin A & D Concentrates (containing 400 A. O. A. C. chick units of Vitamin D, and 3,000 U. S. P. Vitamin A Units per gram), Dried Buttermilk, Dried Skim Milk, Dried Whey, .0001% Riboflavin, Wheat Germ Meal, Cane Molasses, .650% Dehydrated Spinach, Dehydrated Alfalfa Leaf Meal, Animal Liver and Glandular Meal, Dextrose, Soybean Oil Meal, .037% Niacin, 2.00% Irradiated Dried Yeast, Fish Meal, Condensed Fish Solubles, Fish Liver & Glandular Meal, Ground Oat Groats, Linseed Oil Meal, Dicalcium Phosphate, .07 gram Thiamin Chloride, .015%, Choline Chloride, .0019% Ascorbic Acid, .0003% Calcium Pantothenate, 1.60% Corn Germ Meal, ½ of 1% Oxide of Iron, .010% Copper Gluconate, .083% Potassium Iodide, 1.25% Manganese Sulphate, .002% Cobalt Carbonate, .033% Manganese Gluconate, .016% Iron Gluconate, .081% Calcium Gluconate, .008% Zinc Sulphate.

Guaranteed Analysis	Per Cent
CRUDE PROTEIN, NOT LESS THAN	20.00%
CRUDE FAT, NOT LESS THAN	3.75%
CRUDE FIBRE, NOT MORE THAN	5.00%
CALCIUM, NOT LESS THAN	3.25%
CALCIUM, NOT MORE THAN	4.00%
PHOSPHORUS, (P) NOT LESS THAN	1.75%
IODINE, (I) NOT LESS THAN	.068%

May be ordered from the following Veterinary Supply Houses

- F. E. Lentz Co. Philadelphia, Pa.
- Wisconsin Biological Supply Co. Madison, Wisconsin
- Northland Veterinary Supply Co. St. Paul, Minnesota
- Miller Veterinary Supply Co. Fort Worth, Texas
- Detroit Veterinary Supply Co. Detroit, Michigan
- Holmes Veterinary Supply Co. Springfield, Illinois
- The Albany Serum Co. Albany, Georgia
- Grain Belt Supply Co. Omaha, Nebraska

Sold to veterinarians only

FORMULA CY is a product of Ultra-Lite Laboratories, Inc., East St. Louis, Illinois

(COMING MEETINGS—*continued from p. 28*)

the second Monday of each month at 7:00 p.m. in the Antlers Hotel, San Bernardino, Calif. William J. Kelber, 1111 West A St., Ontario, Calif., secretary.

Orange County Veterinary Medical Association, bi-monthly. Donald E. Lind, 2643 N. Main, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. P. H. Hand, Box 1035, Millbrae, Calif., secretary.

Piedmont Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. G. V. McCranie, Hickory, N. Car., secretary.

Pima County (Arizona) Veterinary Medical Association, the third Wednesday of each month, in Tucson. R. W. Adami, 2103 S. 6th Ave., Tucson, Ariz., resident secretary.

Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. Victor T. Oliver, 9705 S.W. Barbur Blvd., Portland 19, Ore., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. H.

(*Continued on p. 34*)

Sold only to Graduate Veterinarians

FUNGASARC

for the effective treatment of skin conditions

Destroys fungi; sarcoptes scabei canis; demodex canis; mites; fleas; lice. Repels ticks. Non Staining; not greasy; has no objectionable odor, destroys odors of external origin. Non Toxic; may be used daily in recommended dilution. Concentrated; one gallon makes four.

Gallon	Quart
$13.95	$4.00
Makes 4 gallons	Makes a gallon

Available nationally through well known Distributors

Osco Chemical Company, Inc.

P.O. Box 2157, Atlanta 1, Georgia

4 supplements to choose from when prescribing for nutritional deficiencies

When diagnosing calcium, phosphorus, vitamin, iodine or trace mineral deficiencies . . . prescribe and dispense one of these Vitamineral Products (all four are exactly alike in their guaranteed analysis, but differ in their sources of vitamins):

VIA-D-MINERAL—Generally fed to dairy cattle, but valuable to all 4-footed animals. Contains 64,000 USP units of vitamin D_2 per pound.

CON-O-MINERAL—Primarily for hogs, beef cattle and poultry. Supplies vitamins A and D feeding oil plus three other vitamin sources.

VIAMINERAL—For finicky eaters, particularly dairy cattle and sheep. Like Con-O-Mineral, it provides three sources of vitamins; but it does not contain feeding oil.

VIAFERM—Used for faster, finer finishing of beef cattle, hogs and poultry. Supplies 10% yeast cultures for fermenting feeds.

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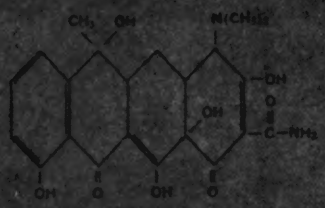
PRODUCTS COMPANY

PEORIA 3, ILLINOIS

Dependable supplement feeds since 19[illegible]5

announcement

Pfizer pioneers a basic formula



Pfizer provides a basic new broad-spectrum antibiotic

Sales to graduate veterinarians only through ethical wholesalers

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Tetracycline

vet

Pfizer Laboratories is pleased to announce the early availability of this newest and most basic broad-spectrum antibiotic for the treatment of a large portion of the infectious conditions encountered in veterinary practice.

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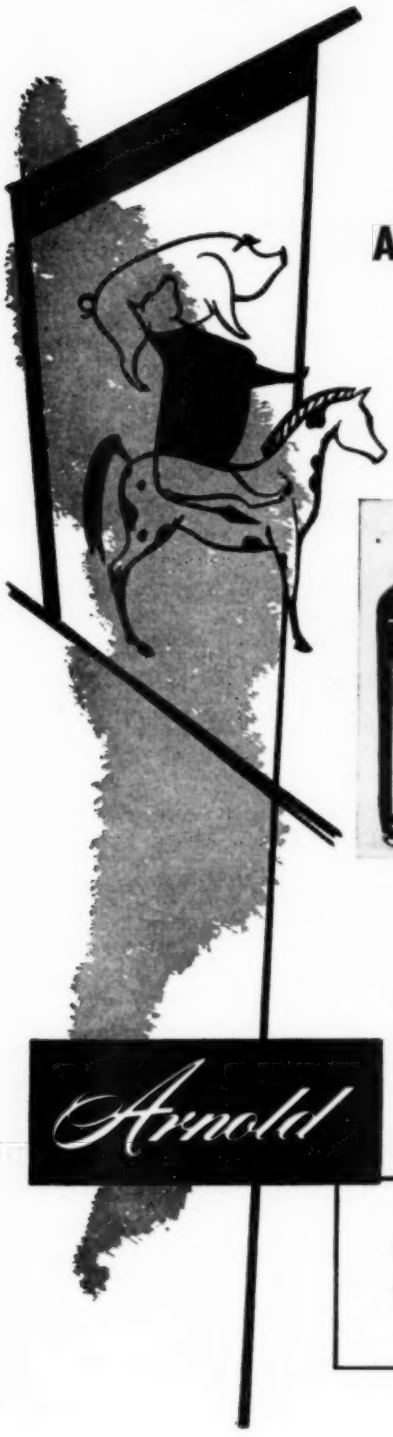
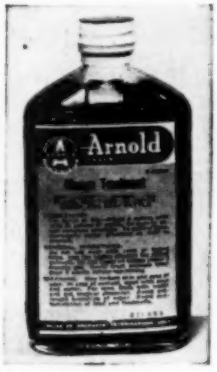
THE STANDARD IN QUALITY
PHARMACEUTICALS



ARNOLD B. H. MANGE TREATMENT



. . . a specific for sarcoptic mange, lice, fleas, and ticks on swine, sheep, and beef cattle.

The principal active ingredient, the Gamma Isomer of Benzene Hexachloride, is active as a fumigant, contact, and stomach poison. When properly applied, one treatment is effective, since it kills both insects, acarians, and their eggs.

Just add one 8-ounce bottle of this concentrated, sparkling red, emulsifiable solution to 12 to 20 gallons of water for spray or dip.

8 oz. Dispensing	1 Doz.	3 Doz.	6 Doz.	12 Doz.
Size	$9.90	$28.21	$53.50	$99.00
Unit Cost	0.83	0.79	0.75	0.69

ORDER TODAY!

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NEW CASTLE, INDIANA

M·A·C

+ QUICK AND SAFE +

in treating Splints, Spavins, Curbs, Sidebones, Inflamed Tendons, Bursal Lameness, Etc.

Single Bottle....$2.00
3 and 1 free.....5.00
6 and 2 free.....9.00
12 and 4 free....17.00
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Advantages of using "M.A.C."

Can be applied in a few seconds.
Only one application in 24 hours.
Does not irritate the skin.
More prompt than blisters.
More humane than firing.

Write for Descriptive Price Sheet of Veterinary Dispensing Products.

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Hudson, N. Y.

5 COMPARTMENT STALL

FORMERLY $179.90

Waterproof. Heavily galvanized sheets. 1½" angle iron frames braced and welded. 1" pipe door frames with dog-proof mesh. Completely assembled. Satisfaction guaranteed.

FORD FENCE

Write for literature and prices on Kennel Fencing

6540 E. WESTFIELD BLVD. • INDIANAPOLIS, INDIANA

(COMING MEETINGS—*continued from p. 30*)

M. Strandberg, 203 D St., Petaluma, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. S. M. Foster, 430 College, Woodland, Calif., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. F. Ferguson, 1702 S. Dort Highway, Flint, Mich., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month except July and August. E. R. Quortrup, 4005 Rosecrans St., Building 2, San Diego, Calif., secretary.

San Fernando Valley (California) Veterinary Medical Association, the second Friday night of each month at Eaton's Restaurant in Studio City, Calif. Howard C. Taylor, 2811 W. Olive Ave., Burbank, Calif., secretary.

Santa Barbara-Ventura Counties Veterinary Medical Association, Friday evenings every sixth week. Dee Wodars McDermott, 5879 Hollister, Coleta, Calif., secretary.

Seattle Veterinary Medical Association, the third Monday of each month in the home of Dr. Fred Cummings, 5828-5th, N.W., Seattle, Wash.

Southern California Veterinary Medical Association, the third Wednesday of each month. Rankin W. McIntyre, 203 Administration Building, Union Stockyards, Los Angeles, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. A. Majilton, 1093 N. E. 79th St., Miami, Fla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month, in Director's Parlor of the Brookside State Bank, Tulsa, Okla. John Carnes, Muskogee, Okla., secretary.

Desenex®

in SUPERFICIAL FUNGOUS INFECTIONS OF HIRSUTE SKIN IN SMALL ANIMALS

Exceptionally effective not only as a powerful *antimycotic agent* — but as a quick acting, long lasting *antipruritic agent.*

Trial quantities sent on request.

Available as

DESENEX OINTMENT ZINCUNDECATE
Tubes of 1 oz.
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POWDER ZINCUNDECATE
Sifter packages of 1½ oz.
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SOLUTION UNDECYLENIC ACID
Bottles of 2 oz. and 1 pt.

Pharmaceutical Division
WALLACE & TIERNAN INCORPORATED
BELLEVILLE 9, NEW JERSEY, U.S.A.

PD-42

NEW small animal cage of molded fiberglas, cleans easily, won't rust, never needs paint

These new Kirschner cages are unlike any cage you've ever seen. Made of white fiberglas-reinforced plastic (pale green, and light grey, also, if you prefer), they are water-proof, stain-resistant and tough as rhino hide!

Your attendants will appreciate the quick, easy way these cages clean up. There are no seams to collect dirt or vermin. Corners are rounded. No trays and no gutter . . . unless you specify that style cage.

Clients are impressed with the smart "looks" of the new Kirschner cage. Veterinarians even tell us it's the first cage they've ever seen that had a professional, hospital-like appearance.

Since fiberglas is warm-to-the-touch (unlike metal), the new cage is easy on the patient. Floor and walls are smooth — no crevices for foot pads to catch in. Drafts are also cut to a minimum.

No painting will ever be needed once you install Kirschner cages. There is nothing to rust or corrode. Cage doors are lifetime aluminum construction. The savings on annual painting alone can easily pay for the slight extra "first cost" of the new Kirschner cages.

We hope this sounds just like what you've been looking for in a small animal cage. We've printed a small folder which gives you prices and detailed facts about this cage and its variety of sizes. Why not fill in the coupon and mail it today.

Kirschner Manufacturing Company
Vashon, Washington
Please send folder on the new Kirschner cages.

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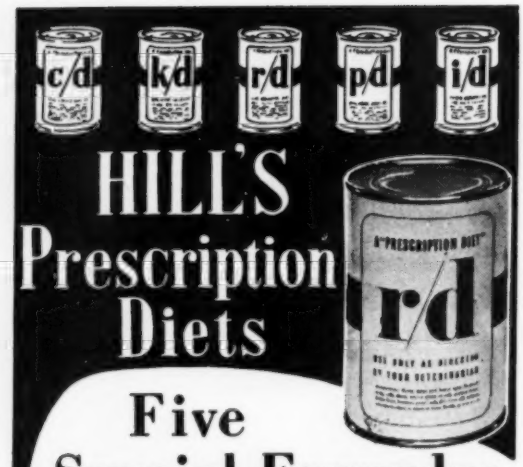
_____street
_____place

Model R-1
features floor sloped toward rear, eliminating need for gutter or tray.

Model R-2
with floor sloping toward front. Gutter available in stainless steel or aluminum.

Model R-3
has flat floor.
All cages available with or without Kirschner **lifetime** aluminum doors.



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Special Formulae

EFFECTIVE WHEN NUTRITIONAL THERAPY IS INDICATED

1. p/d for Reproduction and Lactation
2. r/d for Obesity Correction
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4. k/d for Nephritic Conditions
5. c/d Special diets for Cats

DISPENSED ONLY BY GRADUATE VETERINARIANS

WRITE FOR INFORMATION ON THERAPEUTIC FEEDING

A
(Inquiry form for graduate veterinarians only)
HILL PACKING COMPANY, Box 148, Topeka, Kan.
Send information on therapeutic feeding ☐
Send information on other Hill products ☐
NAME ----------
ADDRESS ----------

HILL PACKING COMPANY
P.O. Box 148 Topeka, Kans.

CLASSIFIED ADVERTISEMENTS

Twenty-five words or less, $2.50; 8 cents for each additional word. Replies sent in care of the JOURNAL, 25 cents extra.

Remittance must accompany order.

Deadline for want ads 8th of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Ambitious veterinarian from accredited veterinary college wanted; permanent, excellent future. Address "Box C 3," c/o JOURNAL of the AVMA.

Veterinarian wanted for small animal practice in Washington, D. C. Experience not necessary. Salary, with percentage; eventual partnership to right man. Unfurnished apartment available, if desired. Address "Box C 5," c/o JOURNAL of the AVMA.

Openings for veterinarians in Salem, Ore., with the State Department of Agriculture. Pay range, $4,728-$5,724 per annum; Federal Social Security program included in state employment. Address Dr. K. J. Peterson, State Veterinarian, Division of Animal Industry, State Department of Agriculture, Salem, Ore.

Staff veterinarian wanted for modern well-equipped small animal hospital. Salary open. Please give full details, education, experience, personal data. Humane Society of Missouri, 1210 Macklind, St. Louis, Mo.

Remittance must accompany advertisement

Assistant veterinarian wanted for small animal hospital in New York City. Write full particulars to Dr. Alexander Slawson, 2414 Amsterdam Ave., New York 33, N.Y.

(*Continued on p.* 38)

POSITION WANTED

1953 graduate of an accredited school with B.A., B.S., M.S., D.V.M., and Ph.D. Graduate work in physiology, bacteriology, and biochemistry. Fifteen-month internship at Angell Memorial Hospital. Will consider small animal practice, commercial or institutional research, or other. Age 34. Veteran. No geographical preferences. Indicate stipend offered. Available October 1st. Address "Box C 9," c/o JOURNAL of the AVMA.

in all cases*

"of great value" in controlling bleeding

KOAGAMIN®

systemic aid to faster clotting

effective "In all cases [KOAGAMIN] was found to be of great value in preventing excessive blood loss where venous and capillary bleeding were complicating symptoms."

safe "No untoward side effects, or incompatibilities were noted."

convenient With KOAGAMIN "...the surgeon has less need for topical hemostatics...a clearer and less cluttered field in which to work."

recommended for routine use "Vitamin K, however, is not needed when this...preparation is used [routinely]. In patients of known prothrombin deficiencies, vitamin K and KOAGAMIN together effect faster control of bleeding."

KOAGAMIN — aqueous solution of oxalic and malonic acids for parenteral use. Supplied in 20-cc. diaphragm-stoppered vials.

*Klausman, B. S.: The Use of a New Chemotherapeutic Agent to Arrest Bleeding in Animals, Vet. Med. *46*:282, 1951.

Chatham **CHATHAM PHARMACEUTICALS, INC** • NEWARK 2, NEW JERSEY

Distributed in Canada by Austin Laboratories, Limited, Guelph, Ontario

ETHICAL PHARMACEUTICALS FOR THE PROFESSION

NEW
MORE POTENT
DY-BIOTIC
(In 100cc Vials)

Each 10 cc. Contains:
Procaine Penicillin G 266,660 Units
Dihydrostreptomycin
(As Sulfate) .....133.3 mg.
Sulfamerazine .....10% (w/v)
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In a special vehicle of
Peanut Oil with 3%
Aluminum Monostearate
1 Vial $2.35
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12 Vials .....Per Vial $2.00
36 Vials .....Per Vial $1.90

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VETERINARIANS ONLY
Check with Order
or
C.O.D.

David Yellen Co., Inc.
CANTON, MASSACHUSETTS

(CLASSIFIED ADS—*continued from p. 36*)

Wanted—Positions

Recent graduate of an AVMA-approved school desires position in small animal or mixed practice. Single; veteran. Address "Box C 4," c/o JOURNAL of the AVMA.

Graduate veterinarian desires assistantship in small animal hospital. Draft exempt; married; age 31. No geographic preference. Have car; available immediately. Address "Box C 11," c/o JOURNAL of the AVMA.

European veterinarian (graduated Brno, Czechoslovakia, 1931) desires position with a serum company, laboratory, et cetera. Address "Box C 12," c/o JOURNAL of the AVMA.

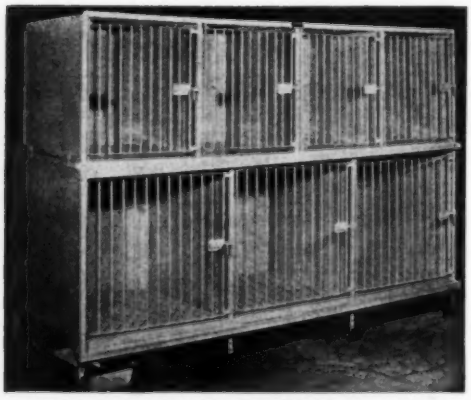
Wanted—Practices

Veterinarian, age 35, eight years' experience in mixed practice, two years Army veterinary corps, desires permanent location in Washington or Oregon. Will consider purchase, lease, or partnership. Address "Box B 21," c/o JOURNAL of the AVMA.

Will buy, or lease with option to buy, predominantly small animal practice in Southeast. Have Georgia and Florida licenses. All correspondence confidential. Address "Box C 6," c/o JOURNAL of the AVMA.

(*Continued on p. 40*)

DE LUXE CAGES AND DOG DRYER



IMPROVED 7-CAGE DE LUXE DRAIN UNIT

The small size is 7½ feet long with 3-30" cages in bottom and the large unit 9 feet long with 3-36" cages in bottom.

Also available in removable tray style, or plain flat floor style without gutter drains.

Our units are available in 3, 5, 7 or 12 cage units, or any combination you need.

"We don't make all the cages but we make the best."

Write for NEW cage booklet; also DRYER FOLDER

NOTE NEW LOCATION

Baltimore Wire & Iron Works

319 Barrow Street Jersey City 2, N. J.

ASK ABOUT 30 DAYS' FREE TRIAL

Our improved dog dryer with entirely transparent doors and larger blower is proving most satisfactory to our numerous users. Many have recommended them to their friends saying "it's doing a wonderful job."

"I get the benefits of modern nutrition, too!"

TODAY OUR DOGS, as well as our children, are enjoying the benefits from the advances in the field of scientific diet!

This knowledge has made it possible to develop a scientifically balanced dog food—Friskies.

50 YEARS' EXPERIENCE IN ANIMAL NUTRITION! The Friskies formula has been tested with dogs of all types at the Friskies Research Kennels on the famous Carnation Milk Farm. Friskies provides every food element dogs are known to need for complete nourishment.

FRISKIES MEAL is a rich source of meat protein and far more nourishing than meat alone. 19 individual ingredients blended into a true-type meal provide an economical balanced diet at every meal. Dogs love its "meaty" taste.

FRISKIES CUBES is the same famous formula as Friskies Meal . . . in crunchy, bite-size form that provides exercise for teeth and gums. And you feed as is—no mixing required. There's nothing to add—not even water.

EITHER FORM OF FRISKIES is available wherever dog foods are sold.

2, 5, 10, 25 and 50 lb. sizes

Friskies

PRODUCED BY THE MAKERS OF **CARNATION MILK**

ALBERS MILLING COMPANY DIV. OF CARNATION COMPANY, LOS ANGELES 36, CALIF.

Wish to purchase a large animal practice, preferably dairy, in Wisconsin. Address "Box C 8," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

Excellent small animal and dairy practice for sale in southern Wisconsin city. Eight-room animal hospital, two-bedroom ultramodern home, 1 acre of land. Excellent opportunity for energetic practitioner. Reason for selling, ill health. Address "Box C 1," c/o JOURNAL of the AVMA.

Mixed practice for sale on West coast; modern small animal hospital, good location in rapidly growing community, a fine clientele. Business grosses well over $30,000 per annum. Address "Box C 2," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Extensive mixed practice for sale in Middlewest. Well-equipped small animal hospital; adjacent residence. Well located. Present owner retiring. Address "Box B 12," c/o JOURNAL of the AVMA.

Small animal hospital near Los Angeles, for sale. No real estate; 40-animal capacity. Gross $26,000; $12,500 cash or $13,500 terms with $5,000 minimum down. Address "Box W 17," c/o JOURNAL of the AVMA.

(*Continued on p. 42*)

Provides an accurate pattern against which to cut with knife or razor blade. Fits firmly, cannot move or slip when clamped into position. Made of non-rusting, light, cast aluminum, highly polished. Lasts a lifetime with minimum care. Simplicity of design and construction reduces possibility of breakage or mechanical failure. Forms immediately available to provide distinctive marking of these breeds:

Boxer — postpaid $15.00
Boston Terrier — postpaid $15.00
Great Dane — postpaid $15.00
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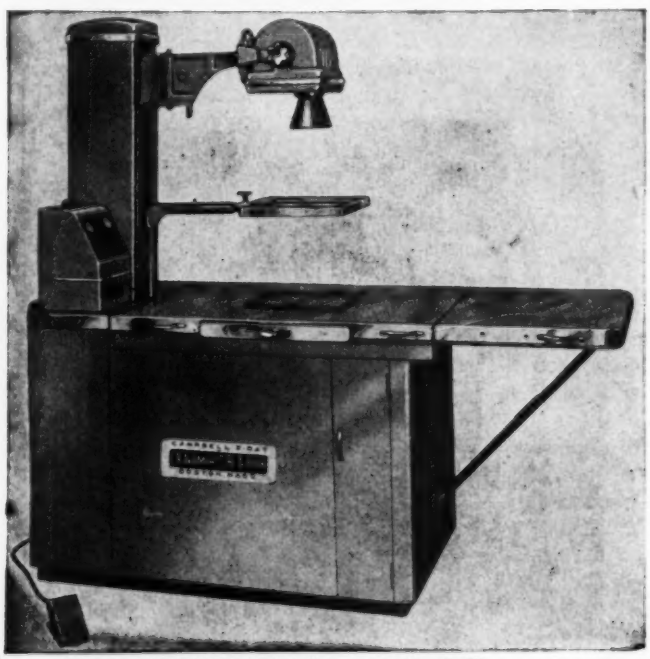
Set of above four — postpaid $50.00

These patented "championship" forms are patterned after markings of winners of top honors in show competition. Forms for other breeds made on special order. Sold to veterinarians only. Send check or money order.

MacALLAN LABORATORIES
Route No. 2, Box 420 Lansing, Michigan



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MAKE SURE THE X-RAY MACHINE YOU BUY REFLECTS SOME THOUGHT OF THE VETERINARIAN IN ITS DESIGN
Don't make the mistake of purchasing a medical outfit designed for use on the human body.

Write for Prices and Terms. Use This Coupon.

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The only complete x-ray machine designed from the ground up for the exclusive use of the veterinarian.

THE BETTER GRADE SMALL-ANIMAL HOSPITALS INSTALL ANIMAGRAPHS

You owe your clients complete service including x-ray. You owe yourself safe, efficient apparatus designed especially for your use.
The Animagraph is a necessity to public health.

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110 Cummington St., Boston 15, Mass.
Kindly send me descriptive information, including prices and terms, on the Campbell X-Ray Animagraph.

Dr. .....
(Please Print)
Address .....
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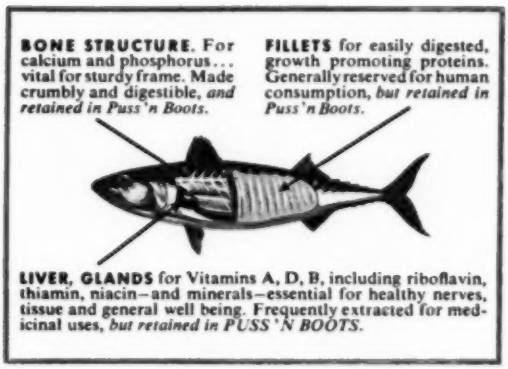
(City and State)

Chandoha photo

When cats eat less food they have more need for balanced food


BONE STRUCTURE. For calcium and phosphorus... vital for sturdy frame. Made crumbly and digestible, *and retained in Puss 'n Boots.*
FILLETS for easily digested, growth promoting proteins. Generally reserved for human consumption, *but retained in Puss 'n Boots.*
LIVER, GLANDS for Vitamins A, D, B, including riboflavin, thiamin, niacin—and minerals—essential for healthy nerves, tissue and general well being. Frequently extracted for medicinal uses, *but retained in PUSS 'N BOOTS.*

Hot summer days normally reduce a cat's appetite. It is then doubly important that each meal provide an optimum variety of vital nutrients.

Puss 'n Boots Cat Food will protect a cat's health and vigor, even when meals are light, because every spoonful contains the proteins, vitamins, minerals and other food elements provided by whole fish and cereals.

PUSS 'N BOOTS IS MADE FROM WHOLE FISH

According to biologists, whole fish represents nature's own ideal balance of life-giving factors. Puss 'n Boots is made from fresh-caught whole fish, thoroughly ground, with cereals added for all-round nutrition, taste and roughage. You can recommend it with confidence to your cat-owning clients, in summer and all-year 'round. It is sold by food stores and pet shops everywhere.

PUSS 'n BOOTS

AMERICA'S LARGEST SELLING CAT FOOD

Coast Fisheries, Division of The Quaker Oats Company, Wilmington, Calif.

another

ROCKLAND "SCOOP!"

Random sampling of ROCKLAND STOCK DIETS resulted in 100% *negative findings* by laboratory examination* for the presence of SALMONELLA organisms. To those engaged in delicate and routine research who may have been concerned with the all-important matter of CONTAMINATION, Rockland Mouse Diet, Rockland Monkey Diet, Rockland Rabbit Ration, Rockland Rat Diet ("D" free), Rockland Rat Diet (complete) and Rockland Guinea Pig Diet ("C" fortified) can now be offered free of SALMONELLA organisms and ANTIBIOTIC ACTIVITY.

**Aliquot of samples placed in Selenite-F enrichment medium. After 6 to 8 hrs. incubation at 37°C, cultures streaked on brilliant green and McConkey's agar plates. Routine examination of suspicious colonies followed.*

Insist upon ROCKLAND (antibiotic free) prepared feeds and ROCKLAND fed animals.

ARCADY

ROCKLAND MOUSE DIET
ROCKLAND MONKEY DIET
ROCKLAND RAT DIET ("D" free)
ROCKLAND RAT DIET (Complete)
ROCKLAND GUINEA PIG DIET ("C" fortified)

THEY MAY BE OBTAINED THROUGH YOUR LOCAL DEALER FROM

ARCADY FARMS MILLING CO.
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Obtain your regular supply of
MICE • RATS
GUINEA PIGS
RABBITS
from
ROCKLAND FARMS
New City (Rockland County)
New York
(Current price list on request)

(CLASSIFIED ADS—*continued from p. 40*)

Large animal practice for sale in Minnesota; gross over $30,000. Home, office, drugs, and equipment. Reason for selling, health. Address "Box C 7," c/o JOURNAL of the AVMA.

Mixed practice for sale or lease in Massachusetts; new home and hospital. Priced at real estate value only. Available immediately; am leaving general practice. Reasonable. Address "Box C 10," c/o JOURNAL of the AVMA.

Mixed practice for sale in city of 70,000. Hospital can be bought or leased. Sale price for drugs and equipment only. Address Bell Animal Clinic, Box 1671, Durham, N.C.

Established mixed practice for sale in good dairy section of western New York. Will sell for value of real estate plus inventory of equipment and drugs wanted. Excellent terms. Only reason for selling—health factor. Address "Box V 13," c/o JOURNAL of the AVMA.

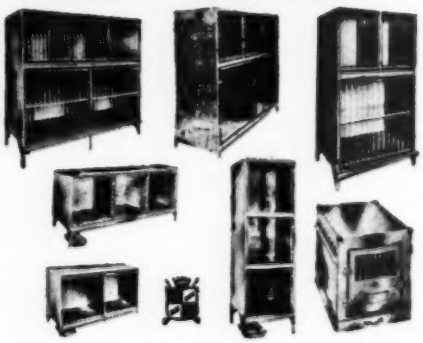
House and completely equipped 23-cage small animal hospital and individual runs for sale. Located in the beautiful resort area of Sullivan County in southeastern New York. Easy terms. Address "Box M 4," c/o JOURNAL of the AVMA.

Small animal hospital for sale; fully equipped, profitable, growing practice, plus acres, with or without residence. In Connecticut near New York City.

(*Continued on p. 44*)

"The Genuine" **THE BEST BUY**

DE LUXE CAGES



All prices show lower stalls depth only. Choice of bar, or 1½" diameter expanded mesh doors. Stainless steel doors made to order. Completely assembled; 300 in stock.

Also available in removable tray style, or plain flat floor style with or without gutter drains in front. Our units are available in 2, 3, 5, 7, 8, or 12 cage units, or any combination you need, in 24" or 28" depth, with or without casters. Compare before you buy, and you will agree that our kennel is excellently constructed, more costly materials used, and cheaper in price. No bolts used on partitions. All doors have double latches, chrome plated; each stall has steel frame, not sheet steel formed frame.

Your attendants will appreciate the quick, easy way these cages clean up. There are no open seams to collect dirt or vermin. IMMEDIATE SHIPMENT.

For more details write for catalog

Style	Units	Size	Price
A	12	7½' x 28"	$585.00
B	8	7½' x 28"	395.00
C	7	7½' x 28"	345.00
D	5	5' x 28"	253.00
E	5	5' x 24"	179.50
F	3	3' x 28"	165.00
G	3	6' x 24"	143.00
H	2	6' x 28"	140.00

PORTABLE WIRE ENCLOSURE

Only 1 minute to set up or take down. Available in 4, 6, and 8 panels.

PORTO PEN	4 PAN	6 PAN	8 PAN
2½ ft.	$10.40	$15.60	$20.80
3 ft.	12.60	18.90	25.20
3½ ft.	13.60	20.40	27.20

DEE-CHICAGO MFG. CO.
Mfrs of Dog Crates, Equipt & Supplies Since 1912
7600 S. Campbell Ave. REP 3300 Chicago 29, Ill.

What does a veterinarian need to do a good job?

Mostly, Doctor, you need things that only *you* can provide. Things like a head that knows *how*. A heart that knows *why*. And capable hands that can be strong . . . or gentle.

But there are some essentials you can confidently expect others to furnish. Research, for example, that seeks answers to *your* problems, and provides the wherewithal to implement *your* skill and "know-how."

If we may, Doctor, that's where the makers of Ken-L-Products can help you. We have been studying the dietary needs of dogs for more than a quarter century. We have developed palatable, completely nourishing Ken-L-Ration, Ken-L-Biskit and Ken-L-Meal to fill these needs precisely. And we also supply Chappel Horse Meat as a prime dietary ingredient.

When you prescribe and use these Ken-L-Products, you can count on healthy dogs and happy patrons.

You can count on *quality* and *acceptance* which will enhance your own professional reputation.

Ken-L-Products A Division of
THE QUAKER OATS COMPANY, CHICAGO

QUALITY DOG FOODS FOR OVER 25 YEARS

New **electric** branding iron uses 110 volt current, heats in just 90 seconds!

Here's the neatest, slickest thing in branding irons yet. This new NICHOLSON *electric* branding iron heats in only 90 seconds on regular 110 volt AC-DC current! Just plug it into house or barn wiring. Won't smoke or corrode. Uses the same fast-heating elements they use on the newest electric ranges. Element is formed into letter B, 3½" high. Supplied complete with 6 foot cord for $21.50. Special 25 foot extension cord, $6.00. Prices FOB Denver. All NICHOLSON precision veterinary equipment is guaranteed—money back if you aren't satisfied.

Order today from
NICHOLSON
Manufacturing, Inc.
Box 7115,
Denver 6, Colorado

NICHOLSON
precision veterinary equipment

(CLASSIFIED ADS—*continued from p. 42*)

An opportunity for one or two men who can make $25,000 or more down payment. Address "Box C 13," c/o JOURNAL of the AVMA.

Practice for sale near large Michigan city; 50% large and 50% small animals. No real estate involved. Clinic located on main highway. Address "Box B 17," c/o JOURNAL of the AVMA.

Found

AVMA key ring found with the following keys, Yale, KT66, UT1446, UT1461; Eagle, 8446F; Slaymaker, BW486; DPCD, 2 keys; small key, metal-box type. Address JOURNAL of the AVMA, 600 S. Michigan, Chicago 5.

Miscellaneous

For sale—animagraph x-ray machine, with attachments, in excellent condition. Address Hamden Veterinary Hospital, 2612 Whitney Ave., Hamden, Conn.

Health and rabies regulations for all states, July issue *Dog World*. Subscribe at $3 one yr., $5, two yrs., $10, five yrs. Any dog book, write us. Judy Publishing Co., 3323 Michigan Blvd., Chicago 16, Ill.

Remittance must accompany advertisement

(*Continued on p. 46*)

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PRINTING
PATIENTS' RECORDS
BOOKKEEPING SYSTEMS
FILES *and* SUPPLIES

For 26 years, the trade mark Histacount has symbolized America's largest printer for Doctors exclusively.

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at the Annual AVMA Convention at Seattle displaying EXCLUSIVE IMPORTED PRODUCTS FAMOUS THE WORLD OVER.

COECOLYSIN BENGEN. The world's only veterinary preparation containing *Peristaltic Hormone.*

OTRHOMIN WEIDNER. A radically new *Broad-Spectrum Chemotherapeutic. Bactericidal, colloidal pole reversing, antiallergic and Gamma Globulin increasing* properties are the scientific basis of its wide range of indications and effectiveness.
The average percentage of bacteriological acute mastitis cures is 84.4%. *By oral and/or parenteral,* not local application. No germ resistance, no interference with cheese-making as in Penicillin treatment.

ELECTROMAGNETIC METAL DETECTOR. A specially perfected electronic diagnostic instrument. It optically pin-points the location of the foreign body. It creates tremendous client goodwill that you cannot buy. Don't let your neighbor get it first. *Brand new model on display.*

SELF EXPANDING TEAT DILATOR. A glance at it convinces you that it is not an ordinary teat plug but a surgical instrument working for you safely and smoothly.

VETAFIL BENGEN. A new synthetic suture for all types of surgery. Not only *completely replaces catgut* but has *many advantages over catgut.* By far more economical too.

PERLON OBSTETRICAL ROPES. Can be sterilized by repeated boiling in water and storing in desinfectants. *Superior to chains.*

RUMENOTOMY DEVICE. The well known silent assistant that does not faint.

FLEXIBLE EMBRYOTOME.

Within a little over one year thousands of American practicing veterinarians have recognized the importance of these products. Won't you join them?

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Amazing! Joseph Goder Incinerator Helps You

get rid of refuse

fast!

Disposall No. 5-T

There's a safe, sanitary, easy way to dispose of pathological waste, animal waste, laboratory waste. Destroy it completely under the intense blast gas flames of a Joseph Goder Disposall No. 5-T!

This remarkable incinerator, designed especially for the veterinarian, has a special grate to catch and eliminate liquids in the refuse — operates odorlessly, economically. Not a free-flowing gas burner, but a much intensified blast-type gas burner.

This feature, plus its exceptional refractory lining and its fool-proof insulation, make the Joseph Goder 5-T what it is — one of the safest, fastest disposals available to the veterinarian.

SEE FOR YOURSELF! Wet, damp, or dry, the refuse "JUST VANISHES" in a Joseph Goder Incinerator.

INCINERATORS Joseph Goder NO ODOR

See your classified telephone directory for the name of the Joseph Goder Representative nearest you . . . or write to Joseph Goder Company for complete information.

JOSEPH GODER INCINERATORS

5121 N. Ravenswood Ave. • Chicago 40, Illinois

(CLASSIFIED ADS—*continued from p. 44*)

Pregnancy Diagnosis—in mare from 45th to 150th day. Write for vials and mailing tubes. Price: $7.00; 2 or more tests, $6.00 each. Pregnancy Diagnostic Laboratories, H. S. Lames, D.V.M., Dysart, Iowa.

Clipper Blade Sharpening

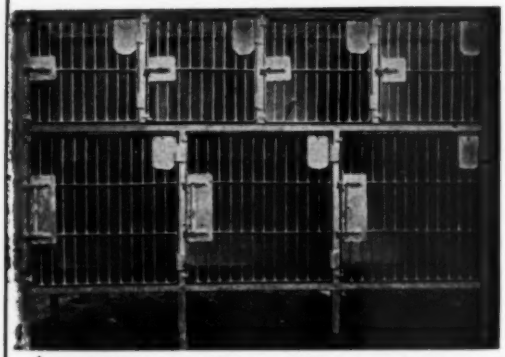
Have your clipper blades sharpened by an expert with 28 years of practical factory training. We know how your blades must be ground to cut like new. Also clipper repairing. All work guaranteed to satisfy you or money back. Now serving veterinary colleges, and over 700 satisfied veterinarians. Why not you? 24-hour service. We ship insured prepaid. Avoid C.O.D. charges; enclose 75 cents for each set with blades. We are headquarters for Oster and Stewart clippers and blades. Complete clipping supplies; upper and lower replacements. Write for information on Oster and Stewart quality clippers and products. Service Grinding and Supply Co., 903 Chicago St., Racine, Wis.

WHITE'S ANIMAL CASTRATION

A new textbook for TEACHERS, STUDENTS and PRACTITIONERS.

Price $7.50

For sale by book dealers, also by the Author, George Ransom White, M.D., D.V.M., P. O. Lock Box 901, Nashville, Tennessee.



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A lifetime of service and guaranteed by one of California's oldest iron works.

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NEW PARD MEAL

with flavor dogs can't resist!

Wonderful flavor? Here's *proof*. You might say we've "gone to the dogs" to get it.

In a recent, impartial feeding test a large number of family-owned dogs were given the chance to compare Pard Meal side-by-side with another leading brand of dry dog food. The containers were unmarked. We even changed the *position* of the bowls at every feeding to be absolutely fair.

The result? Almost *twice* as many dogs went for the Pard Meal as the other brand. The dogs not only preferred Pard Meal—and ate it with relish—but gave every indication that they would *stay* with Pard Meal as long as it was offered to them.

You, as an experienced dog feeder, can forget your doubts about dry-type dog foods! Here is one dogs positively *like* to eat.

But flavor isn't all that recommends this new dry meal. Pard Meal's new formula also includes *extra* amounts of rich meat fat for greater energy and nutrition. It won't flake, powder or turn rancid.

Prove it to yourself, too. Ask your dealer for a supply of Pard Meal. It's available in 25- and 50-lb. bags as well as small cartons.

NUTRITION IS OUR BUSINESS

Swift & Company

PARD is Swift's famous canned dog food, a "pioneer" product of leading brands. Like Pard Meal it's a scientifically complete *food . . . a dog needs nothing more, you can recommend nothing better!*

Correspondence

Bismarck, N. Dak.
June 1, 1954

Editor:

We were very interested in your article on page 478 of the June issue, "The Rabies Trend Continued in 1953."

The same question has come up here a number of times. We have had as many or more cattle affected with rabies than we have dogs. My explanation is quite simple but, I think, explains the circumstance. Dogs out in this country have a great respect for skunks and will seldom, if ever, attack one—in fact, I think the majority of them would run away from the attacking skunk. Cattle, on the other hand, are inclined to turn toward a skunk and for that reason when a skunk affected with rabies gets among cattle we usually see from 1 to as high as 5 cases (which happened on one farm) of rabies among cattle.

Respectfully yours,

s/T. O. Brandenburg, *Executive Officer and State Veterinarian, North Dakota Livestock Sanitary Board.*

• • •

June 8, 1954

American Veterinary Medical Association
Chicago, Illinois
U.S.A.

Dear My Lord:

With sentiments of the highest admiration, I respectfully beg to apply for a grant of boards Scholarship to enable me to come to United States to achieve the knowledge of veterinary medicine from any college or institute My Lord:

My Lord: My father is a very poor, old, African man who has a large family to support and can not afford the expenses of sending me to a college or abroad.

My Lord: I am a boy of 15 years of age, an African, and a Protestant by creed. I have attained the education of Junior Leaving Examination from a Protestants' School in Kenya. I did the final exam. on 26th November 1953 and passed very well, but, due to financial difficulties I could not go to any school. And even our Government can not consider my case for a scholarship because of being from a private school. Then it is therefore necessary for me to ask for some financial help from you my Lord; to enable me to come there at any time to achieve the education my Lord, if I am to have the chance of getting scholarship from you my Lord.

My Lord: I am sure that you will be able to consider my case sympathetically and to see how my case appears very meritorious indeed; and then to offer me your cooperation in this assistance. And if my Lord my request meets with agreeing, then, I have nothing to say now, but justifying you by saying that: I will try my best to show you satisfactions.

My Lord: It will enaible me most to hear from you or get your very favourable reply or admission from you my Lord.

My Lord: I have the honour to be always your most obedient boy.

Yours,
(Name on request)

BROKEN TEETH
—repaired in bottom clipper blades. Top and bottom blades sharpened to match. Save money—Guaranteed. Prices on Request
HIGHLY SPECIALIZED SHARPENING
Sales—Repairing on Oster and Stewart clippers.
Sharpened Blades Tested on Rabbit Fur
Prompt Service—Est. 17 years
CLIPPER SERVICE
OAK RIDGE NEW JERSEY

Laboratory Service for Veterinarians

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These laboratories have been established to aid veterinarians in the diagnosis of obscure as well as common ailments in large and small animals. The chief aim of our staff is to give quick and accurate diagnosis at all times.

Our service includes fecal examinations, anti-biotic sensitivity tests, urinalyses, blood counts, culture work, tissue sections, skin scrapings, and autopsies, and is designed to assist owners and breeders of stock of all kinds including dogs, cats, horses, cattle, poultry, hogs and sheep.

Sample containers for mailing, and price list on request.

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220 East 23rd St., New York 10, N.Y.

Safeguards vision in ocular disease

Cortone®

ACETATE
(CORTISONE ACETATE, MERCK)

CASE HISTORY: A 24-pound, 4-year-old Cocker Spaniel affected with panophthalmitis was effectively treated with intramuscular CORTONE. Injections of 25 mg. were given every eight hours for 48 hours, then every 12 hours for one day, followed by once daily. In 48 hours, temperature had returned to normal and resorption of the staphyloma had occurred. Only a very insignificant area of karatitis remained when treatment was discontinued at the end of the fifth day.[1]

CORTONE produces striking improvement in most cases of inflammatory eye disease. Topical therapy is often desirable in disease of the anterior segment but refractory cases and disease of the posterior segment are best treated with systemic administration.

1. J.A.V.M.A. **108**:304, May, 1951.

OTHER INDICATIONS: Bovine ketosis; extensive burns, allergic dermatoses, and rheumatoid arthritis in dogs, cats, cattle and horses.

SUPPLIED: Saline Suspension of CORTONE Acetate Veterinary: 50 mg./cc., vials of 10 cc.

CORTONE is the registered trade-mark of Merck & Co., Inc. for its pioneer brand of cortisone.

A new highly effective
VETERINARY
DISTRYCILLIN
OINTMENT
SQUIBB
Potassium
Penicillin with
Dihydrostreptomycin
in Squibb Base
SQUIBB

treatment for **MASTITIS**

DISTRYCILLIN*

ointment veterinary

SQUIBB

All the convenience of a liquid plus all the advantages of an ointment

Effective dosage—Each 5-gram disposable syringe of Distrycillin Ointment Veterinary contains 200,000 units of potassium penicillin and 200 mg. of dihydrostreptomycin, formulated in the thorough-penetrating Squibb Base—plasticized hydrocarbon gel.

Broad spectrum—The two antibiotics have an extremely broad anti-bacterial spectrum—broader than any single antibiotic. They insure activity against almost all cases of bovine mastitis.

Thorough penetration—The Squibb Base assures thorough distribution of the antibiotics throughout the glandular tissue. The smooth, free-flowing base retains the same consistency over a wide range of temperature—from 5°F. to 140°F.

Convenient syringes—Supplied in easy-to-use, time-saving disposable plastic syringes—with slip label. Available in boxes of 12. Order now from your veterinary supply house.

For further information, address: SQUIBB, *Veterinary Department*, 745 Fifth Avenue, New York 22, N. Y.

Sold only to veterinarians

*DISTRYCILLIN is a trademark.

A NAME YOU CAN TRUST

NEW
For
MASTITIS

- CLINICALLY PROVEN
- SYNERGISTIC
- BROAD SPECTRUM

Daribiotic*

Massengill

NEOMYCIN—POLYMYXIN B**

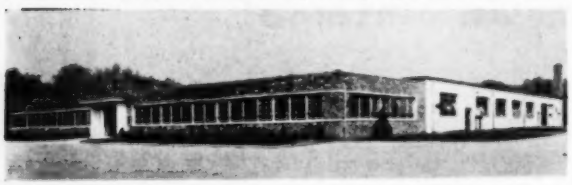
Available in two sizes. Each 7.5-cc tube contains 100 mg. Neomycin Sulfate and 100,000 units Polymyxin B Sulfate. The 100-cc vial contains in each 10 cc, 100 mg. Neomycin Sulfate and 100,000 units Polymyxin B Sulfate in a free-flowing, milk-miscible base.

MASSENGILL
VETERINARY DIVISION
BRISTOL, TENNESSEE

*Patent Applied for

**Licensed under U.S. Patent No. 2,565,057

Professional Printing Company's New Plant



The Professional Printing Company, Inc., for over a quarter of a century the nation's largest printers to the medical professions, began production in its new plant (shown above) at New Hyde Park, N. Y. It is located on 2 acres of attractively landscaped, track-side property. Members of the medical professions are invited to visit the plant and take a tour through its many departments.

Associated Serum Producers Program

Why it is best for an owner to call his veterinarian rather than trying to treat his own animals is the theme of a new advertising campaign being underwritten by Associated Serum Producers in farm magazines with over 6 million circulation. The series continues throughout 1954 in national, regional, and state farm magazines. The theme of the campaign is "First Aid for Sick Livestock."

Other features in this year's campaign conducted in behalf of the profession include news releases, radio broadcasting, farm magazine releases, motion picture showings, and television broadcasting.

The companies underwriting the campaign are: Fort Dodge Laboratories, Inc.; Grain Belt Supply Co.; The Gregory Laboratory, Inc.; Jensen-Salsbery Laboratories, Inc.; Liberty Laboratories; The National Laboratories Corp.; Norden Laboratories; Pitman-Moore Co.; Sioux City Serum Co.; Sioux Falls Serum Co.; The Southwestern Serum Co.; Allied Laboratories, Inc.; Blue Cross Serum Co.; The Columbus Serum Co.; Corn Belt Laboratories, Inc.; and The Corn States Serum Co.

Allied Laboratories Officers

J. L. McKee has been elected president of Allied Laboratories, Inc. He joined the firm in 1934 as assistant secretary, assistant treasurer, and controller, and became a member of the board in 1945 and executive vice-president and treasurer in 1952.

Kenneth F. Valentine, president of Pitman-Moore Company, has been elected executive vice-president of Allied Laboratories. He became a member of the board in 1947. Mr. Valentine will continue as head of Pitman-Moore, a division of Allied Laboratories.

Dr. E. A. Cahill, retiring president of Allied Laboratories, has become chairman of the board. He served as head of the company throughout its first quarter century of existence.

Breakfast beef, a pre-sliced, cured product, is being produced by the Rath Packing Co., Waterloo, Iowa.

for profitable poultry practice, use and dispense

Terramycin®

BRAND OF OXYTETRACYCLINE

TERRAMYCIN POULTRY FORMULA SOLUBLE POWDER

a soluble powder for mixing in the feed and dissolving in the drinking water. Available in ½ lb. jars and 10 lb. canisters, containing 25 Gm. of Terramycin activity per lb.

...to prevent and treat blue comb (mud fever, pullet disease, nonspecific enteritis)

...to prevent and treat hexamitiasis

...to aid in reducing mortality of chronic respiratory disease and infectious sinusitis

TERRAMYCIN SUSPENSION IN OIL

an oil suspension for subcutaneous and intrasinusal injection. Available in 100 cc. and 500 cc. vials, each cc. containing 25 mg. of Terramycin.

...to treat and control chronic respiratory disease (CRD)

...to treat infectious sinusitis

TM-5 and TM-10 (Terramycin Animal Mixes)

especially designed mixes for incorporation in animal and poultry feeds and pre-mixes. Available in 50 lb. bags, each lb. of TM-5 containing 5 Gm. and each lb. of TM-10 containing 10 Gm. of Terramycin activity.

...for nutritional supplementation when fed at low levels

...for disease control when fed at high levels

PFIZER LABORATORIES, Brooklyn 6, N.Y.
Division, Chas. Pfizer & Co., Inc.

VETERINARY DEPARTMENT

Pfizer

hi!

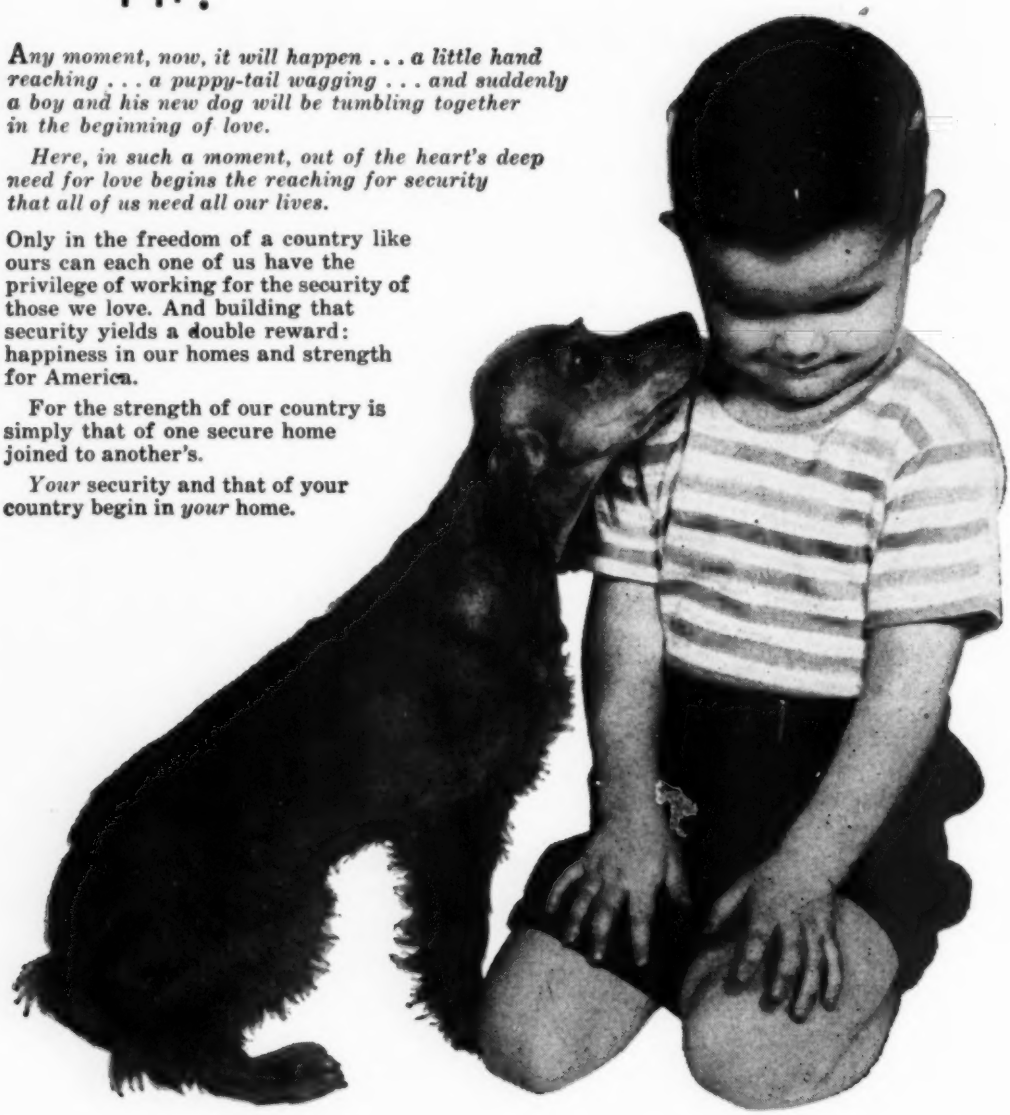
Any moment, now, it will happen . . . a little hand reaching . . . a puppy-tail wagging . . . and suddenly a boy and his new dog will be tumbling together in the beginning of love.

Here, in such a moment, out of the heart's deep need for love begins the reaching for security that all of us need all our lives.

Only in the freedom of a country like ours can each one of us have the privilege of working for the security of those we love. And building that security yields a double reward: happiness in our homes and strength for America.

For the strength of our country is simply that of one secure home joined to another's.

Your security and that of your country begin in *your* home.



Saving for security is easy! Here's a savings system that really works—the Payroll Savings Plan for investing in United States Savings Bonds.

This is all you do. Go to your company's pay office, choose the amount you want to save — a couple of dollars a payday, or as much as you wish. That money will be set aside for you before you even draw your pay. And automatically invested in United States Series "E" Savings Bonds which are turned over to you.

If you can save only $3.75 a week on the Plan, in 9 years and 8 months you will have $2,137.30.

U.S. Series "E" Savings Bonds earn interest at an average of 3% per year, compounded semi-annually, when held to maturity! And they can go on earning interest for as long as 19 years and 8 months if you wish, giving you back 80% more than you put in!

For your sake, and your family's, too, how about signing up today?

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REGULAR N. F. or DRENCH TYPE

1 lb. can (12 to case)	$ .84 per lb.
5 lb. can	.80 per lb.
10 lb. drum	.78 per lb.
25 lb. drum	.76 per lb.
150 lb. drum	.73 per lb.

PHEN O BOLES®

12½ gram Bolus—Box of 25	$1.50
12½ gram Bolus—Box of 100	5.40
2 gram Tablet—Bottle of 100	.85

PEST CONTROL

BENZENE HEXACHLORIDE
10% gamma isomer wettable

6 lb. bag	38c per lb.
4-6 lb. bags	33c per lb.
8-6 lb. bags	30c per lb.

METHOXYCHLOR 50% WETTABLE "MARLATE" 50 (DuPont)

4 lb. bag	78c per lb.
6-4 lb. bags	74c per lb.
12-4 lb. bags	70c per lb.

DDT 50% WETTABLE POWDER

1 lb. bag (12 per case)	45c per lb.
10 lb. drum	38c per lb.
25 lb. drum	36c per lb.

DDT TECHNICAL POWDER
for preparing oil spray solutions

1 lb. can (12 per case)	60c per lb.
10 lb. drum	55c per lb.

SODIUM FLUORIDE TINTED

5 lb. drum	48c per lb.
25 lb. drum	37c per lb.

SULFONAMIDES

SULFANILAMIDE USP POWDER

1 lb. bottle	$1.90 per lb.
10 lb. drum	1.85 per lb.
25 lb. drum	1.75 per lb.
100 lb. drum	1.60 per lb.

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1 lb. bottle	$4.75 per lb.
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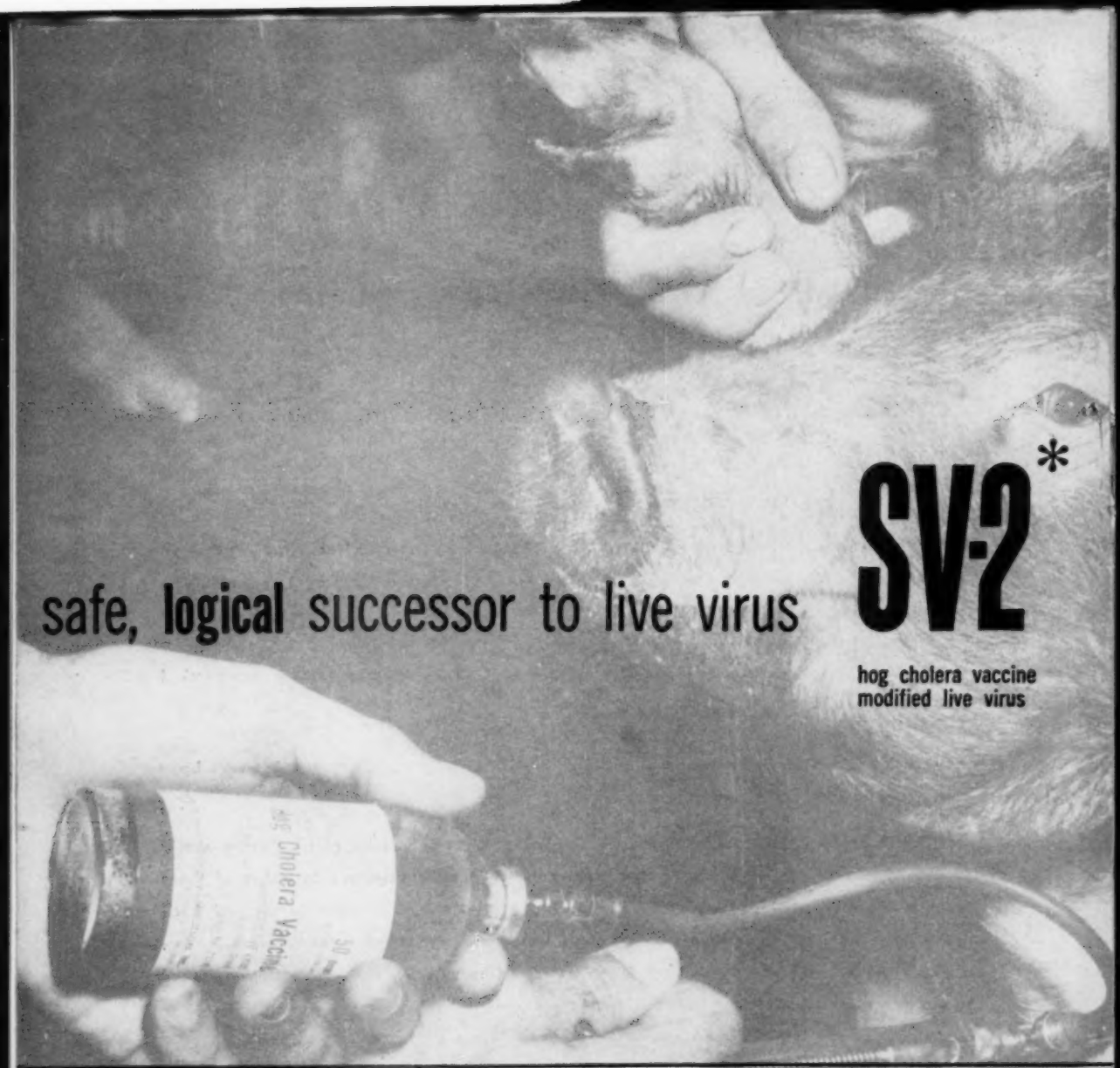

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